TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

MARCH 1, 1961
Price 50c

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Let our "Revenue Men"

TAKE THE KINKS OUT OF YOUR KNOTTY DIRECTORY PROBLEMS!

Take a man like
Tom Wells...

Tom is one of our "Revenue Men" in Columbia, Missouri.

A member of the Golden Directory Club for sales achievement, he is representative of the "Revenue Men" who help telephone companies increase revenue from directory sales.

Tom started to work with the General Telephone Directory Company as a sales representative in Fort Wayne, Indiana, in 1957. In 1959 he was promoted to the position of Sales Supervisor and transferred to his current post in Columbia, Missouri.

He and his wife make their home in Columbia now with their son and daughter. A great sports enthusiast, Tom is also an active member of the Knights of Columbus.

Tom Wells is another example of the "Revenue Men" who work for the General Telephone Directory Company and for you. Men who are an asset to any community.

Our Directory "Revenue Men" provide the Independent Telephone Industry with a flexible and highly skilled telephone directory organization. These men—working out of 35 strategic locations—are experienced specialists, trained to give you *complete* and *quality directory service.*

They act as telephone company representatives in their day-to-day contacts with your customers, not only selling and supervising the sale of Yellow Pages advertising—but also acting as public relations representatives for you in their dealings with the public.

Thoroughly trained to know any condition that pertains to telephone service, they're experienced hands at helping large and small Independent Telephone Companies "take the kinks out of knotty directory problems!"

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Des Plaines, Ill.
VAnderbilt 4-2164

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Honolulu, H. I. • Lexington, Ky. • Long Beach, Calif. • Madison, Wis.
Manila, P. I. • San Angelo, Tex. • San Francisco, Calif. • Spokane, Wash.

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Telephone
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EDITORIAL STAFF

ROY F. SMITH
Publisher

JOHN G. REYNOLDS
Editor

DICK REYNOLDS
Production Mgr.

PAT CULLINAN
Editorial Assistant

JOHN S. REED
Technical Editor

ROLAND DAVIES & FRED HENCK
Washington Editors

Contributing Editors
BILL CORMAN
C. D. EHINGER
L. A. GRITTEN
G. M. JONES
D. A. PERIGO
LEO SANDS
ALLAN R. STACEY

ADVERTISING STAFF

DONALD C. SORENSEN
Advertising Manager

RAY GERACI
Promotion Manager

BETSY MEYERS
Advertising Assistant

KEITH H. EVANS & ASSOCIATES
3723 Wilshire Blvd.
Los Angeles 5, Calif.
Tel. — DUnkirk 8-2981
515 Market St., Rm. 225,
San Francisco 5, Calif.
Tel. — YUkon 2-4280

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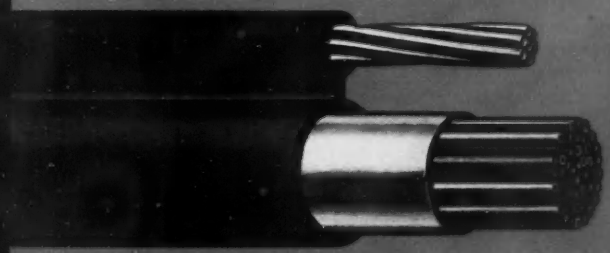

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Aluminum or copper shield.
Speeds excess voltages to ground.

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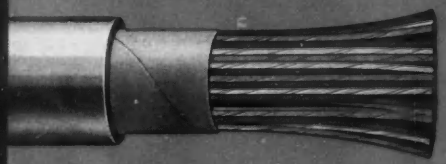
Used extensively in severe lightning areas.



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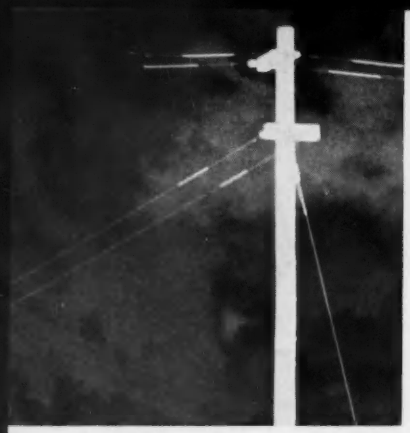

The Perpetual Problem of Lightning Damage

By ROY SAVAGE

Roy Savage, director of supply sales, Automatic Electric Sales Corporation.

The other day, we had one of those noisy, Chicago-area thunderstorms, complete with plenty of lightning. That storm brings to mind one of the oldest problems in telephony—protection of outside plant. It's a problem that presents both a duty and a challenge to telephone men. We have a duty to protect those who use our equipment. We are challenged to safeguard our investment.

When lightning crackles around cable, the damage of a direct hit is obvious—a shattered pole, a cable fused into a solid mass. But when the cable is not struck directly, a less apparent danger can develop. Excessive voltages may be produced on telephone lines by means of induction. This occurs more often than direct hits. When it happens, a free charge travels through the cable. If it reaches a weak spot in the insulation, the charge bursts through. Conductors are ruined, transmission cut off.

GROUNDING PREVENTS DAMAGE

However, if a well-constructed ground is present and a well-constructed shield used, the excess voltage speeds harmlessly out of the cable into the ground. Because of their ability to prevent damage, certain grounding practices deserve constant review.

Grounding is relatively simple when telephone equipment is placed jointly with power lines. The power lines help provide an overhead shield against lightning. Grounding consists of merely cutting into the power company's existing system.

In rural areas, telephone plant is usually installed separately. A lack of tall structures increases the danger of lightning strikes, making it necessary to install grounding rods every ¼-mile or less.

Low overall resistance makes grounding effective (15 ohms or less is adequate). Factors contributing to resistance are: type of soil, temperature and moisture of the soil, and the length and depth of the rods.

Fill soils, containing refuse, ashes or cinders are lowest in resistance, averaging 14 ohms. This resistance is lowered further as temperature and moisture increase.

The greater the contact area between rod and soil, (or, the longer the rod) the lower is resistance. The depth to which rods are driven is important in two ways: (1) Deeper soil is less resistant than upper soils, and (2) In areas where freezing takes place, the rod should be driven below the average frost line.

All of these factors should be employed for maximum grounding effectiveness. A resistance test should be taken as a final assurance that the installation will do the job.

IMPORTANCE OF EQUIPMENT

Grounding practices are only as good as the equipment used to carry them out. Cable protection begins with the cable itself. Features to look for in cable are uniformly low resistance and aluminum or copper shielding. These prevent voltage breakthrough and speed charges to the ground connection. Ground rods and clamps of high-conductivity copper and high-strength steel take voltages rapidly into the ground.

These precautions are extensive and involve work, but they are well worth it. We need only to witness the fury of lightning to appreciate the importance of plant protection.

NOTE: More detailed information on this subject may be obtained by writing Mr. Savage at Automatic Electric Sales Corporation, Northlake, Illinois

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Elgin 8-9280

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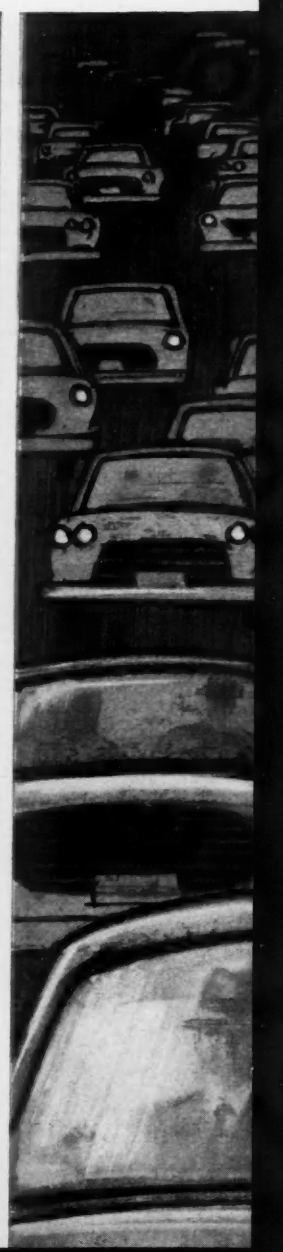
MESSAGE-WAITING LIGHT: neon lamp in PETITE Phone or standard Stromberg-Carlson telephone alerts guest there is a message for him. No need to ring rooms repeatedly.



means increased revenue for you!

Stromberg-Carlson provides you with the most modern equipment to meet all their needs

Modern America on the move demands the most modern in telephone service! Stromberg-Carlson provides the latest in motel/hotel PBX equipment to help you meet their needs. Up-to-the-minute, modern message-waiting light instruments, in manual or dial . . . full range of colors . . . room-to-room dialing . . . single-digit dialing for most wanted services . . . turret or floor type PBX's . . . call-meters at check-out desk—all are evidence of a continuing program to give you the latest and best at the lowest cost.

Choose Stromberg-Carlson equipment to serve these and all your telephone needs.

For more details, call your Stromberg-Carlson representative. In Atlanta, call: TRinity 5-7467; Chicago: STate 2-4235; Kansas City: HArrison 1-6618; Rochester: HUbbard 2-2200; San Francisco: OXford 7-3630.

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A DIVISION OF **GENERAL DYNAMICS**

ONE-DIGIT DIALING FOR SERVICES: by dialing a single digit, guests can get room service, maid and valet service, garage, outside line, long distance operator and other services.

RAISE YOUR REVENUE?

with the new ELECTRONIC SECRETARY®

Just about every commercial customer from A-Z is a prospect for an ELECTRONIC SECRETARY phone answering set. For example: those who can't afford to have a phone go unanswered – or who want to make telephone announcements – or who'd like to cut the cost of clerical message-taking.

They'll find an ELECTRONIC SECRETARY set a shrewd and low-cost investment – and a cinch to use. Just the flick of a switch or button sets the unit to answer the phone; another flick and message-taking models play back the calls received.

National advertising is swelling an already big demand. For full information about our new models, call or write one of the distributors below.

A **EASY INSTALLATION.** Requires only a simple two-wire hook-up to a connecting block. Plugs into any 115 volt, 60 cycle AC outlet.

B **EASY RECORDING.** User simply presses a button—speaks into microphone to record the message that will answer calls. Easily erased and changed.

C **EASY "SETTING."** User jus flicks a switch or presses a bu ton to activate ELECTRONI SECRETARY® set when he' leaving phone unattended.

Electronic Secretary Industries, Inc., Subsidiary of GENERAL TELEPHONE & ELECTRONICS

IT'S EASY AS A B C

phone answering sets

D **EASY PLAYBACK.** By pressing another button, user immediately gets every message that has come in and been recorded in his absence.

E **EASY TRANSCRIPTION.** An earphone and pedal control make it easy for girl to type orders or reports . . . even in noisy offices.

F **EASY TO OFFER.** Just the right ELECTRONIC SECRETARY set for any size business from complete line that includes LP (Long Play), SP (Short Play) and AO (Answer Only) models.

Distributed by

AUTOMATIC ELECTRIC SALES CORPORATION

400 North Wolf Road Northlake, Illinois

LEICH SALES CORPORATION

427 West Randolph St. Chicago 6, Illinois

Here's the NEW CALCULAGRAPH "POSITIVE GUIDE" Tab Ticket Plate*

Assures Still Greater Toll-Timing Accuracy

This is the newly developed "positive guide" tab ticket plate that provides positive protection against misalignment of tab-size toll tickets without any loss of speed. Now you can completely eliminate inaccuracies due to improper registration of the toll time. What's more, this new ticket plate is interchangeable with existing plates. This means the change can be made in the field without disrupting operations on your switchboard. And it only takes a minute or two to do — it's that easy.

This new development adds to the long list of Calculagraph engineering accomplishments that have solved telephone industry toll-timing problems for more than six decades. Plan now to add this new feature to your Calculagraphs.

**Also available for Calculagraph "round" models.*

CALCULAGRAPH Company

276A Ridgedale Avenue, East Hanover, New Jersey

coming

CONVENTIONS

KENTUCKY Tel. Assoc., Phoenix Hotel, Lexington, Ky., March 7, 1961.

TEXAS Tel. Assoc., Rice Hotel, Houston, Texas, March 12-14, 1961.

IOWA Tel. Assoc., Savery Hotel, Des Moines, Iowa, March 23-24, 1961.

INTERNATIONAL POLYTECHNIC SYMPOSIA, Auditorium of the Engineering Societies, New York City, April 4-6, 1961.

NEBRASKA Tel. Assoc., Cornhusker Hotel, Lincoln, Nebraska, April 5-6, 1961.

OHIO Tel. Assoc., Deshler Hilton Hotel, Columbus, Ohio, April 18-19, 1961.

WISCONSIN Tel. Assoc., Plankinton House, Milwaukee, Wisc., May 2-3, 1961.

INDIANA Tel. Assoc., Claypool Hotel, Indianapolis, Ind., May 9-11, 1961.

ILLINOIS Tel. Assoc., Pere Marquette Hotel, Peoria, Ill., May 17-19, 1961.

KANSAS-MISSOURI Tel. Association, Continental Hotel, Kansas City, Mo., May 22-23, 1961.

PENNSYLVANIA Tel. Assoc., Pocono Manor Inn, Pocono Manor, Pa., June 5-7, 1961.

WASHINGTON-OREGON Tel. Assoc., Empress Hotel, Victoria, B. C., June 15-16, 1961.

NEW YORK Tel. Assoc., Scaroon Manor, Schroon Lake, N. Y., June 19-21, 1961.

CALIFORNIA Tel. Assoc., Hawaiian Village, Honolulu, Hawaii, June 26-30, 1961.

FLORIDA Tel. Assoc., The Carillon Hotel, Miami Beach, Fla., Nov. 26-28, 1961.

For Multipair Wire...

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ready access wire terminal

- Used with wire-messenger supported Multipair Wire
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- Accommodates up to four Catalog No. 105 (6-pair) Terminal Blocks
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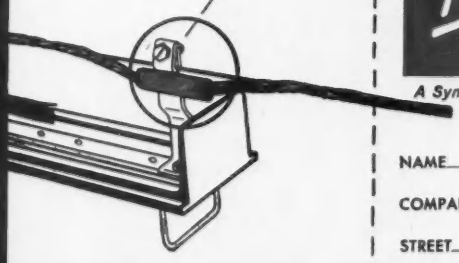

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A Symbol of Integrity Since 1909

Please send me current literature describing Ready Access Wire Terminals.

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COMPANY_____

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CITY_____ ZONE____ STATE_____

NEWSLETTER
TELEPHONE INDUSTRY

Prepared By The Editorial Staff of TELEPHONE ENGINEER and MANAGEMENT

ON THE 1st OF EACH MONTH ★ ON THE 15th OF EACH MONTH

Dear Sir: March 1, 1961

A. T. & T. PUTS $86 PRICE ON STOCK OFFER . . . American Tel. & Tel. Co. has fixed price of $86 a share for its giant common stock offering to almost two million shareowners. The $965,350,000 raised, based on 11,225,000 shares offered, represents largest private financing venture in United States history.

AT&T is offering stockholders right to buy stock on basis of one share for every 20 held on Feb. 23. Rights to buy new stock will be mailed Mar. 10 & will expire Apr. 14.

AT&T directors declared regular quarterly dividend of 82½ cents a share to be paid Apr. 10 to shareowners of record March 10. Dividend is scheduled to be raised to 90 cents quarterly in July.

Since stock offering was first disclosed on Dec. 21, price of AT&T common has risen almost steadily. It sold for under $100 a share on that day. On Jan. 31 it reached all-time high of $117 a share, or $351 on old stock before 3-for-1 split in 1959.

VOSS REPORTS ON NEW GENERAL DYNAMICS DIVISION . . . Last month John Voss, vice pres. & gen. mgr., Telecommunication Div. of General Dynamics Corp. reported "The formation of the General Dynamics/Electronics Division (see page 54, 2/15/61 TE&M) with the Stromberg-Carlson identity being retained as a continuing trade name in the Telecommunication Industry, assures our customers of increased corporate support with an ever-broadening base of research and development."

"Independent telephone companies," he stated, "continue to look to our Division, located in Rochester, N. Y., to lead the way in advanced electronic developments to serve tomorrow's operating company needs."

Referring to Stromberg-Carlson's 67-year history of serving the Independent telephone industry, Voss reported that "our Division has just completed its most successful year. Acceptance of our products is at an all-time high. This solid background of growth and acceptance insures a stability for the future which has been acknowledged by General Dynamics in substantial research and new product development support, stimulating the introduction of new products and services within the areas served by the telephone industry. . . ."

BELL SYSTEM SETS INTERPHONE DRIVE . . . American Tel. & Tel. Co. & its cooperating systems have started advertising a new Home Interphone system. System makes it possible to use telephones for communications inside house as well as for outside calls. National advertising started with color spreads in March issues of Diplomat, Holiday, House Beautiful, House & Garden, The New Yorker, Sports Illustrated and Town & Country.

System, which costs about $6 per month plus installation charges, has been market tested since last June in parts of four Bell units – Mountain States Tel. & Tel. Co., Southern Bell Tel. & Tel. Co., Illinois Bell Tel Co. & Bell Tel. Co. of Pennsylvania.

REA TELEPHONE LOANS . . . Loans recently approved by Rural Electrification Administration include: FOUR STATES TEL. CO., Brownwood, Texas; $320,000 loan to furnish initial service to 516 subscribers & to improve service for 85 subscribers in Greene and White counties, Ark. . . . DEER RIVER TEL. EXCHANGE, INC., Deer

Please turn to page 12

PRODUCT DEPENDABILITY *is built into*

Phelps Dodge Aerial & Duct Telephone Wire & Cable!

In every Phelps Dodge aerial and duct telephone wire and cable, dependability of product is recognized as the first requirement for satisfactory service.

Phelps Dodge achieves product dependability by combining years of manufacturing experience with the most modern research and development facilities throughout its fabricating process. This controlled method of building in quality *during* manufacture assures customers reduced maintenance costs and trouble-free service—important advantages that only true product dependability makes possible.

Phelps Dodge will gladly help you fill your aerial and duct wire and cable requirements, recommend the correct constructions to fit your needs. Just call your nearest Phelps Dodge sales office.

PHELPS DODGE COPPER PRODUCTS
CORPORATION

SALES OFFICES: Atlanta, Birmingham, Ala., Cambridge, Mass., Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Dayton, Denver, Detroit, Fort Wayne, Greensboro, N. C., Houston, Indianapolis, Jacksonville, Kansas City, Mo., Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Ore., Richmond, Rochester, N. Y., San Francisco, St. Louis, Seattle, Tampa, Washington, D. C.

(Continued from page 10)

River, Minn., $580,000 loan to improve service for 641 subscribers & furnish initial service to 174 subscribers in Itasca county . . . FARMERS UNION TEL. CO., Sussex, N. J., $1,155,000 loan to improve service for 1,831 subscribers & furnish initial service to 971 subscribers in portions of Sussex county, N. J.; and Orange county, N. Y.

VIRGIN ISLANDS TEL. CORP., Charlotte Amalie, St. Thomas, Virgin Islands, $1,730,000 loan. This new borrower of REA funds presently operates 128 miles of line serving 2,514 subscribers through common battery-magneto exchanges at Charlotte Amalie, Christiansted and Frederiksted. REA loan funds will be used to provide initial service to 1,381 subscribers & improved service to 1,106 subscribers in rural areas of the Islands . . . MUENSTER (TEXAS) TEL. CORP., $490,000 loan was made to provide new service to 240 subscribers; to improve service for 738 subscribers, & to construct 86 miles of new line, and headquarters facilities.

COMMISSION SUSPENDS NEW YORK TEL. EAS PROPOSAL: — New York Public Service Commission has suspended proposal of New York Tel. Co. to extend metropolitan service in Syracuse area to 10 or more outlying exchanges & to increase rates to all area subscribers. Commission said it will set hearing on proposal at later date.

New York Tel. initiated Extended Area Service (EAS) for Syracuse to several exchanges in 1950. Under present proposal company would provide toll-free service between Syracuse & affected communities & between various groups of outlying exchanges. Plan, if approved, will eliminate 73 tolls.

FINANCIAL BRIEFS . . . Regular quarterly dividend of 19¢ per share on its common stock was declared last month by board of directors of General Tel. & Electronics Corp. Donald C. Power, chairman of board & chief executive officer, announced it will be payable on March 31 to shareowners of record on February 21. Regular quarterly dividends of 55¢ per share on 4.40% Preferred Stock, 59.375¢ per share on 4.75% Convertible Preferred Stock, 53.125¢ per share on 4.25% Convertible Preferred Stock, 66¢ per share on 5.28% Convertible Preferred Stock, & 54.5¢ per share on 4.36% Convertible Preferred Stock, each of which is payable on April 1 to shareowners of record on February 21, were also declared . . . Board of directors of Philippine Long Distance Telephone Co., declared dividend of 40 centavos (p. 40) per share on 8% Cumulative Convertible Preferred Stock of Company, payable April 15 to stockholders of record on March 15. Dividend is for quarter ending April 15. Board of directors also declared dividend of 25 centavos (p. 25) per share on Common Capital Stock of Company, payable April 15, to stockholders of record on March 15.

Chenango & Unadilla Telephone Corp., Norwich, N. Y. declared its 156th consecutive quarterly dividends on its preferred & its 142nd consecutive dividend on its common. $1.12½ dividend on preferred will be paid April 15; 30¢ dividend on common stock was paid Feb. 15 . . . Southern Bell Tel. & Tel. Co. board of directors authorized $70,000,000 debenture issue to be offered for sale at competitive bidding in March. Proceeds will be used to redeem a 35-year, 5½% issue due Oct. 1, 1994, now outstanding in amount of $70,000,000 & redeemable at 103.36% of principal amount. Company expects to call these debentures for refunding on or about April 20, 1961, Pres. Ben S. Gilmer said.

Earnings of $2.01 per share in 1960, compared with $1.90 per share in 1959, were announced by Pres. Clifton W. Phalen of New York Tel. Co. Phalen pointed out

Please turn to page 14

NATIONAL YELLOW PAGES SERVICE

IS NOW OFFERED BY

Thornhill Publishing Company

Now recognized by the Bell Telephone Company as a participant in the National Yellow Pages Service program, Thornhill Publishing Company can substantially increase over-all directory advertising revenues of independent telephone companies.

Your customers can buy yellow pages display and in-column advertising in any market in the United States or Canada by simply placing a *single order* through one contact and one contract, and pay for it through only one monthly bill.

National advertisers served by your telephone company will welcome this new service because:

NATIONAL YELLOW PAGES ADVERTISING

- *Tells customers* why *to buy as well as* where *to buy*
- *Presents sales message in permanent form*
- *Provides access to more than 4,000 telephone directories*
- *Permits flexible marketing pattern in selected directories*
- *Merchandising and promotional services are available with each contract*

For complete details on how NYPS can increase your directory revenues, just fill in and mail the coupon below or contact our office nearest you.

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Please send me additional information about National Yellow Pages Service.

Name_____

Firm_____

Address_____

City_____ Zone_____ State_____

NEWSLETTER TELEPHONE INDUSTRY

(Continued from page 12)

that during '60 telephones increased by about 309,000 while invested capital increased by more than $150,000,000. Phalen emphasized that improvement in earnings is important because of large amount of new capital which must be obtained for company's expansion program. He said that more than $300,000,000 will be put into construction, improvement, & expansion during 1961, a greater sum than in any prior year in company's history . . . Regular quarterly dividend of Southwestern States Tel. Co. has been increased from 30 to 32 cents per share. Next dividend is payable at new rate on March 1 to shareowners of record Feb. 1.

WITH THE STATE LEGISLATURES . . . In NEW MEXICO, two additional plans to abolish New Mexico Public Service Commission & place its duties under elective corporation commission have been submitted to state legislature. Bill calling for state constitutional amendment setting up elective 5-member State Corporation Commission was introduced by Rep. Laurence Goodell of Roswell. Measure providing for elective 3-member State Corporation Commission, with additional powers & duties of Public Service Commission, was sponsored by Sen. R. C. Morgan of Portales. Earlier proposal called for merging both regulatory agencies into a 5-member board appointed by governor to regulate & control all public utilities & common carriers. This legislation was introduced by Senate Majority Leader Fabian Chavez.

In MONTANA, bill which would require rural electric & rural telephone cooperatives to file rate schedules with State Public Service Commission was introduced in Montana legislature by Rep. Helen C. Johnson of Gallatin.

In MINNESOTA, revenue-raising recommendations submitted to Minnesota legislature by Governor Andersen in his budget message included proposals for new 3 per cent excise taxes on telephone, telegraph & electric bills. He estimated tax on telephone & telegraph bills would raise $9.8 million in next two fiscal years, while tax on electric bills would produce $15.6 million.

In TEXAS, bill to permit rural electric cooperatives to continue serving territories where their customers are annexed to cities was introduced in Texas legislature by Rep. Alonzo Jamison of Denton. Similar bill was introduced earlier by Senators Culp Krueger of El Campo & Charles Herring of Austin . . . In NEW JERSEY, Gov. Robert B. Meyner proposed balancing record $467 million budget for coming fiscal year by obtaining 39 million dollars through higher motor vehicle license fees & new taxes on real estate sales & utility bills.

WITH THE COMMISSIONS . . . In MICHIGAN, John E. Tormey has been appointed member of Public Service Commission for term expiring June 30, 1965, succeeding James H. Lee. Tormey has been director of commission's Railroad Division for past two years & prior to that served as an assistant attorney general assigned to the commission . . . In NEW JERSEY, Ralph L. Fusco, president of Board of Public Utility Commissioners, has been appointed judge of Superior Court of New Jersey. To succeed Judge Fusco on Public Utility Commission, Governor Meyner has appointed William F. Hyland. Hyland, a lawyer from Collingswood, N. J., is graduate of Wharton School of Finance & University of Pennsylvania Law School. He was admitted to bar in 1949; has been member of New Jersey General Assembly since 1954; in 1958 he was Speaker of General Assembly.

In NORTH DAKOTA, Richard J. Thompson has been elected to full six-year term on Public Service Commission. He succeeds Anson J. Anderson who did not seek re-election. Thompson, of Underwood, N. D., has long record of service in North

Please turn to page 16

installation requirement: 130 minutes and eight screws

ACHIEVERFONE

AChieverfone can be installed faster and easier than any other mobile radiotelephone. In fact, AChieverfone requires approximately two hours for complete installation while other common carrier systems need from three to seven hours for the very same operation.

AChieverfone was specifically designed for easy installation. For example, all signaling and decoding control functions have been combined into one compact control head. The entire unit fits quickly on or under the dashboard with just *four* mounting screws. The compact R-T unit can be installed in the car trunk with only *four* sheet metal screws. A single plug-in, control cable connects the two units and supplies power.

Ease of installation is just one outstanding feature of AChieverfone. Low initial and operating cost, multiple frequency capability and unmatched reliability are other reasons why you should seriously consider this common carrier system for all your customers.

SPECIFICATIONS—FCC Type Accepted

Transmitter: 144-174 Mc, 4-Channel
RF output: 22.5 watts into 52 ohm load

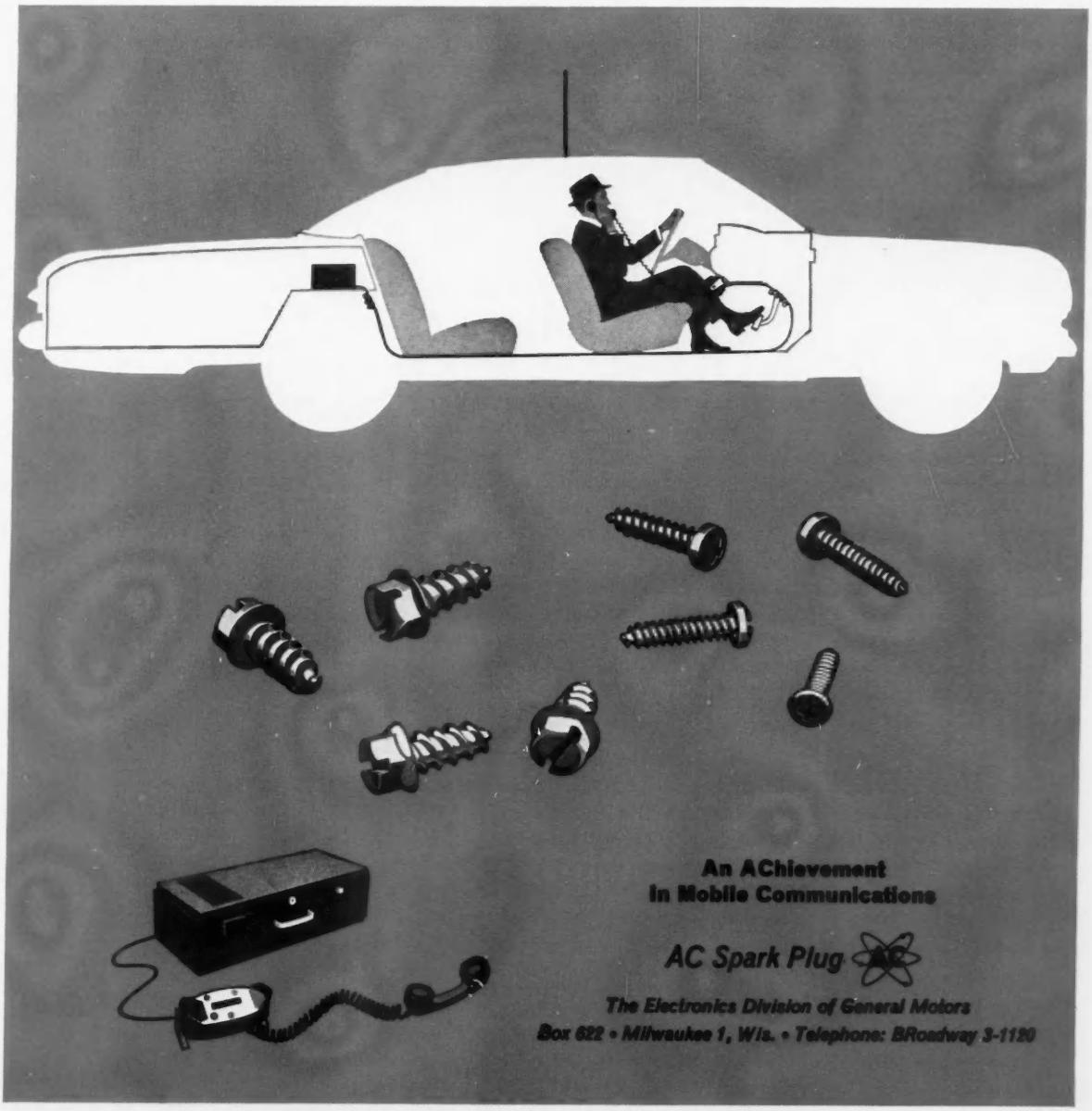
Receiver: 144-174 Mc, 4-Channel
Wide Band (60kc) or Narrow Band (30kc) models available (Wide Band quickly converted to narrow by substituting only IF filter)

Frequency Stability: within 0.0005%

Selective Signaling: 51,000 five-digit (compatible, 2-tone, sequential) codes available

Size: Receiver-Transmitter, 21⅛" x 8⅞" x 6¼"

Weight: 35.5 pounds, including receiver-transmitter, control head and interconnecting cable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NEWSLETTER TELEPHONE INDUSTRY

(Concluded from page 14)

Dakota Legislature & has been actively engaged in farming & other business interests . . . In CALIFORNIA, Governor Brown appointed Frederick B. Holoboff to Public Utilities Commission to succeed Theodore H. Jenner. Holoboff is a lawyer from Del Mar, California, who received his LL.B. degree from U.C.L.A. in 1954. He has been serving as Chief Deputy City Attorney, Utility and Regulatory Law Section, of the City of San Diego since June, 1959.

In MASSACHUSETTS, Honorable Roy C. Papalia has been designated chairman of Department of Public Utilities. Max Freedman & Dominic Agrippino were appointed to membership on DPU succeeding Francis X. Lang & Troy T. Murray . . . In MONTANA, Louis G. Boedecker has been elected member of Public Service Commission for 6-year term. Commissioner Boedecker succeeds Austin B. Middleton who retired after completing his last term of office . . . In NEBRASKA, Richard H. Larson has been re-elected to a fourth term of six years on State Railway Commission. Joseph J. Brown was elected by Commission to continue as chairman of commission, & Dee E. Butcher was elected to continue as secretary.

WORTH WRITING FOR . . . Jan. issue of "Automatic Electric Technical Journal" features articles on: (1) Materials & production techniques used to assure printed wiring of quality required for telephone central-office & subscriber-station equipment; (2) "The Model LP 'Electronic Secretary' Answering Set;" (3) "The 57A Microwave Path Protection System;" (4) "Extension of Type A SATT Systems to Direct Distance Dialing;" (5) "Relays for Industrial Applications." Copies may be obtained by writing Editor, Public Relations Dept., Automatic Electric Co., Northlake, Ill.

TAX BOOKLETS AVAILABLE. — Two new publications of Internal Revenue Service are available. "Your Federal Income Tax" was prepared to give assistance to individual income taxpayer. Its 144 pages contain simple explanations & examples of problems encountered in preparing income tax returns. Over 100 new rules & changes in tax laws, rulings & regulations are fully explained to help taxpayer understand their meanings. "Tax Guide For Small Business" is 144-page treatment of various problems that sole-proprietors, partnerships & corporations encounter in dealing with income, excise & employment taxes. One of the features of this booklet is a 1961 Tax Calendar reminding businessmen of important tax dates during year. Each booklet sells for 40¢ a copy & may be obtained at District Internal Revenue Offices or from Superintendent of Documents, Government Printing Office, Washington 25, D. C.

COMMISSION ORDERS . . . In ILLINOIS General Telephone Co. of Ill. was authorized to apply its applicable dial rates to its recently acquired dial exchange at Topeka, Mason County. Rates are same as for Havana. Extended area service will be given between Havana and Topeka . . . Marseilles Tel. Co. authorized to increase rates for telephone service in Marseilles $15,000 a year . . . Raleigh Tel. Co. authorized to purchase property of William H. Upchurch, d/b/a Raleigh Tel. Co., for $12,000. Purchasing company is newly formed corporation . . . Inland Tel. Co., authorized to operate in territory now served by Cooksville Tel. Co.

ACQUISITIONS & MERGERS . . . Request by General Tel., Co. of Southwest for certificate permitting it to discontinue service at Freedom, Okla., exchange, when it is taken over by Pioneer Telephone Cooperative, Inc., was granted by FCC. Co-op is buying General exchange for $30,000.

Cinderella

The most thoroughly tested lightweight phone available to the industry! Hundreds of thousands of units exactly like the Cinderella (even the parts are interchangeable) are already in use in homes across the country. This means you have two readily available supply sources for parts. You're ahead when you specify "Cinderella"!

Available in white, rose pink, aqua blue, light beige, light grey, sea green . . . with outside ringer for main station use, or without ringer for use as an extension . . . with matching soft coiled handset cord and installation cord . . . non-skid, non-mar rubber base pad . . . convenient night-light switch. Available from stock—immediately!

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but that's not all! ITT Kellogg not only offers the product, but also helps you sell it! See next page.

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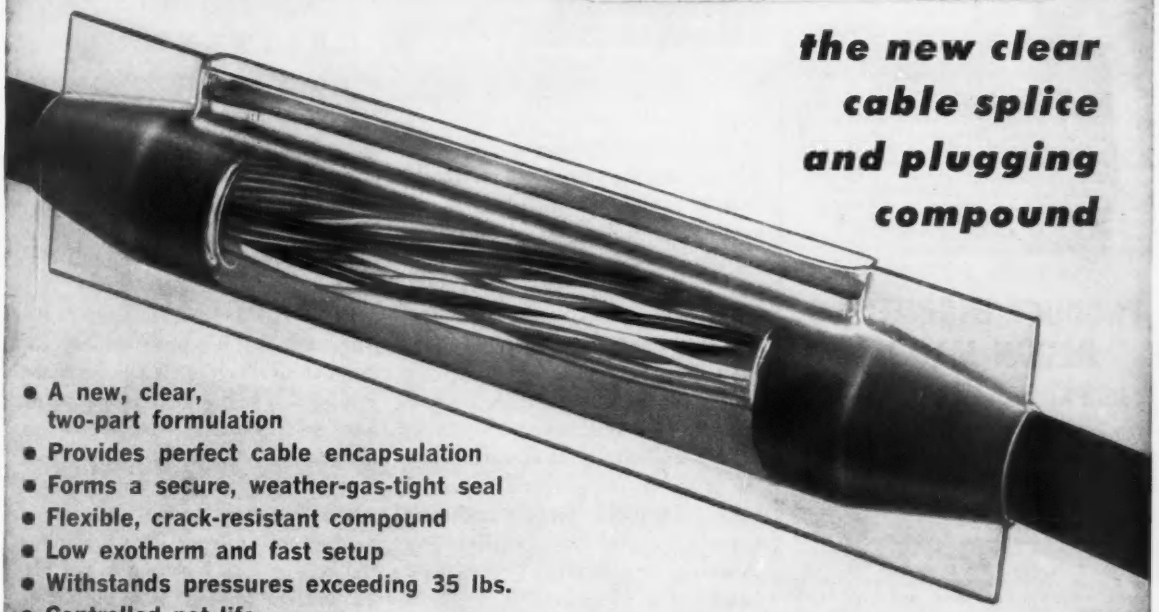
INTRODUCING

SEMPER • SEAL

the new clear cable splice and plugging compound



- **A new, clear, two-part formulation**
- **Provides perfect cable encapsulation**
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- **Flexible, crack-resistant compound**
- **Low exotherm and fast setup**
- **Withstands pressures exceeding 35 lbs.**
- **Controlled pot life**
- **Controlled cable penetration**

Semper-Seal, a new epoxy-type resin incorporating the advantages of proven durability, weather-tight sealing and transparent clarity for perfect cable encapsulation. The simple to use and transparent qualities of Semper-Seal enables field splices and blocks to be accomplished and inspected in a minimum of time with the visible assurity of knowing a solid seal has been made. Semper-Seal is a two-part compound consisting of a resin and hardener which when mixed together create a thermosetting action. The compound, through its own chemical change will, in 30-45 minutes, become a solid, clear, air-tight seal.

Write today for complete information on NEW Semper-Seal.

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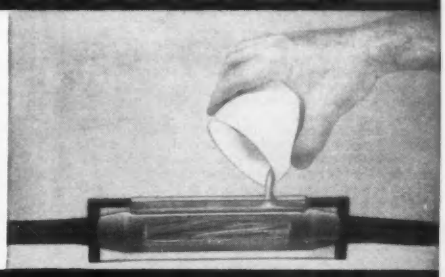
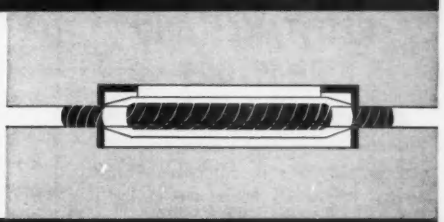
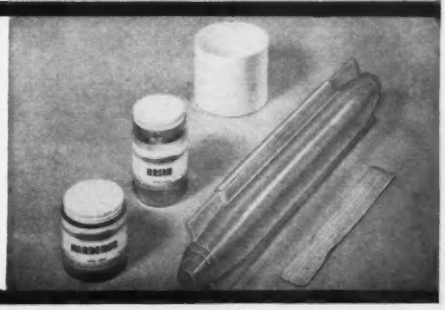
Windsor Locks, Connecticut



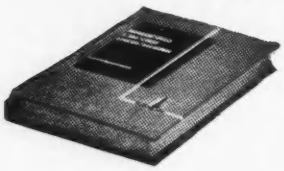
Semper-Seal being poured into the plastic Vu-Mold which has been tape-sealed over the cable opening.



Semper-Seal provides an ideal means of forming trouble splices on pressurized cables.



Semper-Seal is available in convenient kits or in bulk form.



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Just Published! Here's a practical manual of tested product-engineering aids to help you get quicker, easier solutions to every day work problems. It offers a ready-made file of methods, formulas, tables, and charts for engineering top efficiency into devices, components, or complete products. Covers a full range of topics, from accessories and assemblies to clutches, control devices, electrical components, etc. Includes such modern developments as ultrasonics and automated assembly. *Over 1100 drawings show vital design details.*

PRODUCT ENGINEERING DESIGN MANUAL

Edited by Douglas C. Greenwood

Editor, Product Engineering Design Digest

342 pp., 8½ x 11, over 1100 illus., $9.

The book provides a storehouse of material to stimulate you to new design ingenuity, and to help you gain improved mechanisms, better assembly methods, and savings in materials and time. Over 100 topics are systematically arranged and illustrated. You can see how each device works, what it does, and how it meets design requirements. Thus, the book gives you the "feel" of a problem by showing in detail what is good, what has been done, and what is acceptable.

Gives up-to-date facts and data on resistors

Just Published! This book thoroughly covers fundamentals and needed data in the use of resistors in electronic design. You get groundwork in the basic aspects of resistance and descriptions of each type of resistor, the materials used in its manufacture, and characteristics associated with each type. Comprehensive tables give most manufacturers' data, with specific types of resistors covered in common tables. Thus, a design or components engineer can easily determine the scope of what is available. Full attention is given to such important areas as reliability in resistors, measurements, etc.

RESISTANCE AND RESISTORS

By Charles L. Wellard

Technical Director, Clifton Precision Products Co.

264 pp., 6 x 8, 82 illus., $8.50

Among the book's many special features you will find a detailed treatment of precision films as a replacement of wire-wound resistors. Included, too, is information on the preparation of precision films by pyrolysis, evaporation, and reduction of oxides. Numerous charts and graphs present information that heretofore has seldom been readily available regarding the power and voltage ratings of resistors, the varieties of material used in their construction, and their many industrial applications.

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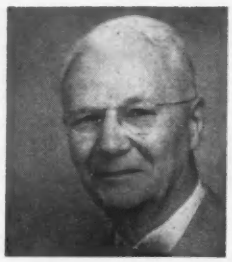

INDUSTRY OBSERVATIONS

By L. A. GRITTEN

Back To Pre-History

IN strange ways we moderns reach back to our primitive beginnings to assist the technology of today. In California, General Telephone Company has problems of stringing cables across canyons and up steep cliffs. So Construction Foreman Walt Marchert first shoots a light line across, with a gun that fires a brass ramrod instead of a bullet.

We wonder if Walt is watched by the ghosts of the primeval engineers who bridged their canyons and their mountain rivers in a similar way thousands of years ago? They used bows and arrows and fiber cords, instead of a 45-70 calibre gun and a nylon line — but they built their bridges!

Wade H. Dean

THE career of Wade H. Dean, head of the Oregon-Washington Telephone Company until his death last December, epitomized a phase of our industry. He entered the business in its romantic heyday, when all one needed to start a telephone system was a little money, a lot of courage and unlimited hard work and resourcefulness. He was a successful Independent telephone man for 55 years; but like many of our versatile leaders in those early days, he was much more than that. Born in Colorado, he was of the west, western, an individualist who asked no man for a job but made jobs for others. He was in his own business in his teens; and in his twentieth year he swapped a stage line for a tiny telephone system — 38 telephones and a magneto board.

Wade Dean built his little company to its present stature of 35,000 stations, but that was one of a multitude of interests. He was a leader in the promotion of dams, roads, power plants, locks, real estate developments, fruit orchards, anything that promised progress for the Columbia Gorge country he loved.

Probably the small telephone company and what it represented is passing out of the picture. Soon there will be only a few huge concerns, or one government system. We move into an era of bigness, rigid regulation, compulsion and conformity in which there will be no place for a career such as Wade Dean's, nor for the growth of such a company as his. In that era to come, our businesses and the men who run them may be the finest products that uniformity, homogeneity, standardization and coordination can impress upon us. Yet it may still be well to remember that what made this country the last best hope of a free world was the spirit of individual endeavor in men who cared nothing for conformity. That spirit is exemplified by the thousands of little telephone companies and men of the Wade Dean type who built them.

Not WATS But How

INDEPENDENT resentment of the Bell System WATS proposals, expressed by the U.S.I.T.A., state associations and individual companies, has little to do with the service itself; that is generally recognized as a great step forward. It is a protest against the arbitrary and inconsiderate manner in which WATS has been presented to Independent companies whose operations and finances are affected and whose participation is requested.

Any change of Bell System service affecting Independent revenues and

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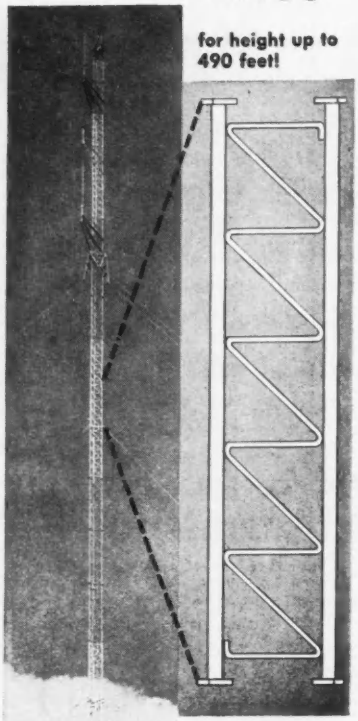
ROHN COMMUNICATION TOWER *No. 60*



for height up to 490 feet!

Shown here is a ROHN No. 60 tower installed to a height of 200 feet with 3 five-foot side arms, mounting antenna for police radio communications.

★ This extremely heavy duty tower is designed for a wide variety of communications of all kinds.
★ This No. 60 ROHN tower is suitable for height up to 490 feet when properly guyed and installed.
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★ Designed for durability, yet economical — easily erected and shipped. ROHN towers have excellent workmanship, construction and design. Each section is 10 feet in length.

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practices should call for adequate opportunity for arrangement in advance of equitable settlements, as a matter of ordinary business courtesy. There is nothing new about this. Nearly every interstate long distance rate change in recent years has been accompanied by a similar lack of consideration.

The Independents are not powerless to correct the situation. It has been suggested more than once that Independents should intervene vigorously in each and every Bell company application to any regulatory body, state or federal, to the end that adequate satisfaction of Independent interests should be prerequisite. With the local political support that could be enlisted on the Independent side, this could be effective strategy. The present actions of U.S.I.T.A. and General T. & E. before the F.C.C. could prove to be merely a beginning in this direction.

This sort of thing is undesirable to the vast majority of Independents; we could do with less regulatory control, not more; but it may be necessary. Much trouble could be avoided by Bell System formulation of fair and proper liaison with the Independents concerned, when such changes as WATS are forthcoming.

After WATS, What?

THE WATS impact may be merely the start of a major deterioration of the Independents' best source of revenue. We are threatened by a long-range change of habit that will be harder to meet than the current transition from message to flat rate charges for long distance calls.

In the future, public use of modern varieties of mail and telegraph service will grow faster than our long distance telephone service. One of the reasons for the comparatively slow development of long distance telephone traffic in Europe, notably in Great Britain, has been the superiority of the mail and telegraph services. In England one habitually sends a message and receives an answer by telegram in a few minutes, or by letter in a few hours; those services have been so fast, reliable and inexpensive that the more costly telephone call has suffered in competition. In the United States, on the contrary, the comparatively poor quality of our mail and telegraph services has favored the development of long distance telephone traffic.

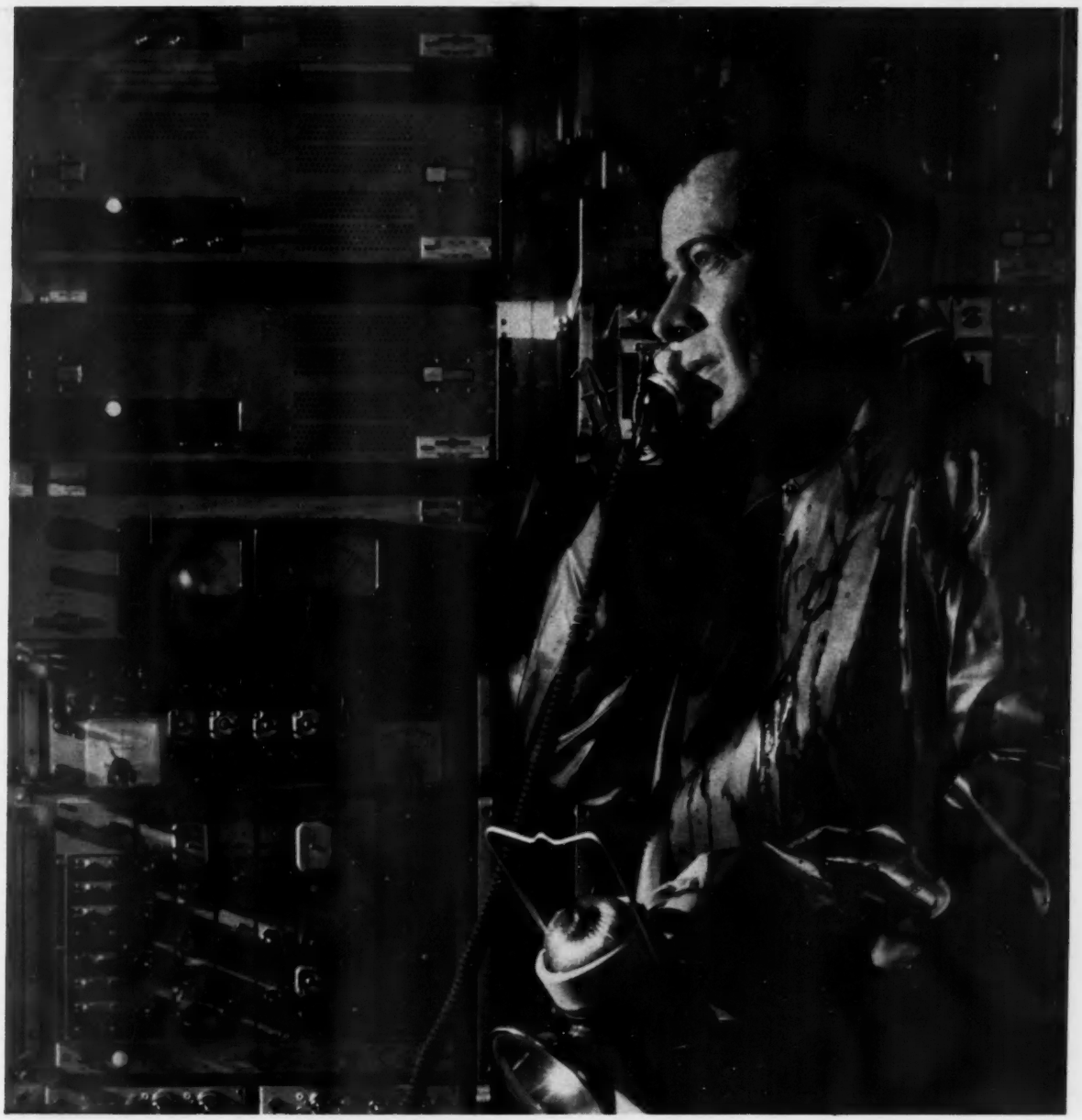
This will change. Facsimile mail, data transmission and the use of space satellite repeaters will open up a new world for the message carriers. Written and pictorial messages will be sent and received anywhere in the world in a matter of seconds, at a cost far less than the rates for long distance telephone conversation now are, or conceivably can become. The combination of rapid service at lower cost, that favored mail and telegraph against telephone in certain European counties during the past half-century, will operate here in the years to come.

What that may presage for the little Independent telephone companies will depend on their ability to embrace and become a part of the change, and the degree of their cooperation with U.S.I.T.A. and with each other, to that end. The closer our organization, the better will be our prospects of profitable survival in the changing world of communications.

Odds N' Ends

YOU are a telephone man? You use your 'phone many times every day of your life? Then now, without another look at the thing, turn your back to it, take pencil and paper, and make a rough sketch of a telephone dial. Fill in each hole the correct letters and numbers. If you can do that, nothing in this world is beyond your reach. You are a superman!

At a certain turn in the Molalla River in Oregon, now and then the river goes wild and eats up a lot of valuable farm land. As always in these socialistic times, Uncle Sam was called in to do something about it. The U. S. Army Engineers' estimated cost of limiting the erosion was $188,000. That was too much, even for the farmers. They borrowed a tractor, cut a 500-foot channel, in two weeks, at a cost of $1500 (to themselves, not a cent to the taxpayer!); and the erosion was controlled.



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Now . . . security against even momentary outages during power-disrupting storms. Collins' dc-powered Microwave and Carrier Systems operate directly from float-charged batteries — eliminating rotating machinery. The results: improved reliability, reduced power drain, lower maintenance, decreased noise and elimination of standby generators. Several voltage combinations are available, enabling you to select the one that best integrates with your existing plant. For technical literature, write Collins Radio Company, Texas Division Sales, 1930 Hi-Line Drive, Dallas 7, Texas.

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COLLINS

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keeping up with COMMUNICATIONS

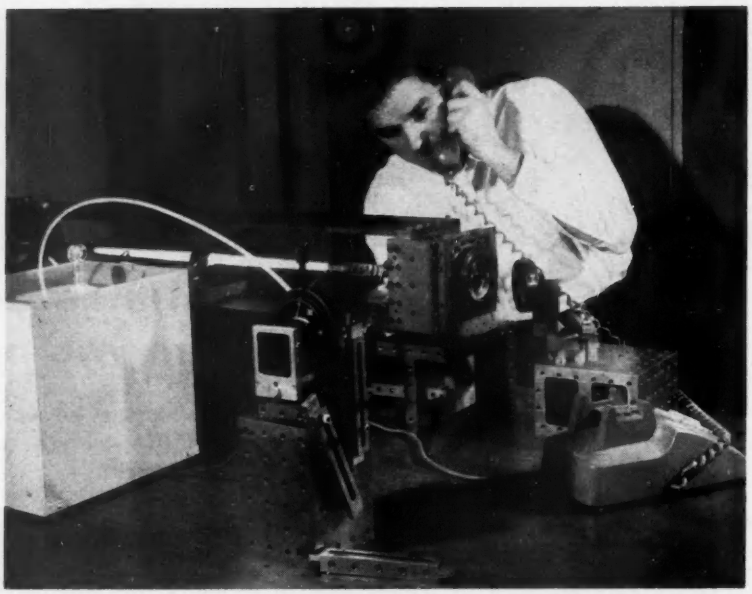
Continuously-Operating Maser Permits High-frequency Communications

BREAKTHROUGH in research leading toward high frequency transmission appeared last month in an announcement by Bell Telephone Laboratories scientists of a continuously operating optical maser. The device uses a mixture of helium and neon gases for its active medium. It receives its energy from a low-powered (tens of watts) electrical discharge within the gas, and has an output power of about 1/100 watt.

Lying in the infrared portion of the frequency spectrum, the beam of coherent radiation is highly directional, having a spread less than one minute of arc. A gaseous optical maser on earth, operating through a suitable telescope, could send a beam to the moon that would cover a spot smaller than one mile in diameter.

Communication engineers have been awaiting a continuously operating generator of coherent optical frequencies. The wide bandwidths associated with carrier frequencies in this portion of the spectrum could provide a pathway for huge amounts of information.

Bell Laboratories scientists have been experimenting with several methods of modulating a signal on an optical carrier. As an initial experiment, they impressed a telephone conversation on a maser signal on December 14, 1960, by using an electro-



A Bell Telephone Laboratories scientist, DONALD R. HERRIOTT, demonstrates technique for impressing telephone conversations on coherent beam of infrared light generated by continuously operating, optical gas maser. Coherent light can be made to carry intelligence just as radio waves do. Information-handling capacity of coherent light, however, is millions of times greater than that of radio waves. The infrared beam is invisible except with special viewing apparatus.

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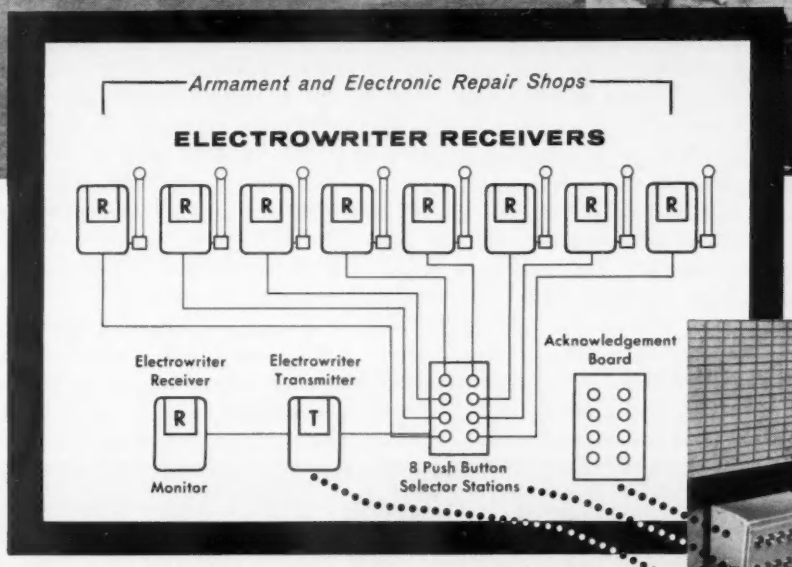
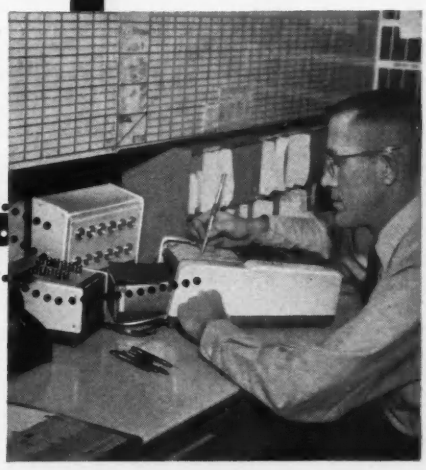
UNITED STATES AIR FORCE





Dispatcher

Here's how ADC *Says it in writing* AT HAMILTON AIR FORCE BASE

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"Keeping Up With Communications"

(Continued from page 26)

optical device — the Kerr Cell. Broadband modulation has been accomplished at frequencies up to 60 kc. In fact, other modulation schemes may result in systems operating as high as several thousand mc.

The path of the optical carrier will be a straight line, except where it is reflected. Thus one application of the optical maser would be to transmit information to and between orbiting satellites. On earth, the beam could be contained in some enclosure, such as a long pipe. This pipe could wind around the countryside carrying signals with very little loss, if turns were made at angles containing reflecting mirrors.

In contrast to all the intermittent or "pulsed" optical masers announced heretofore, the new system takes a radically different approach, using a gaseous discharge to achieve continuous operation.

Also, instead of being excited by a high powered flash of light, the gaseous optical maser receives its energy from an electrical discharge of very low power. The coherent beam of radiation lies in the infrared portion of the spectrum, and is thus invisible except through a "sniperscope" or similar converter.

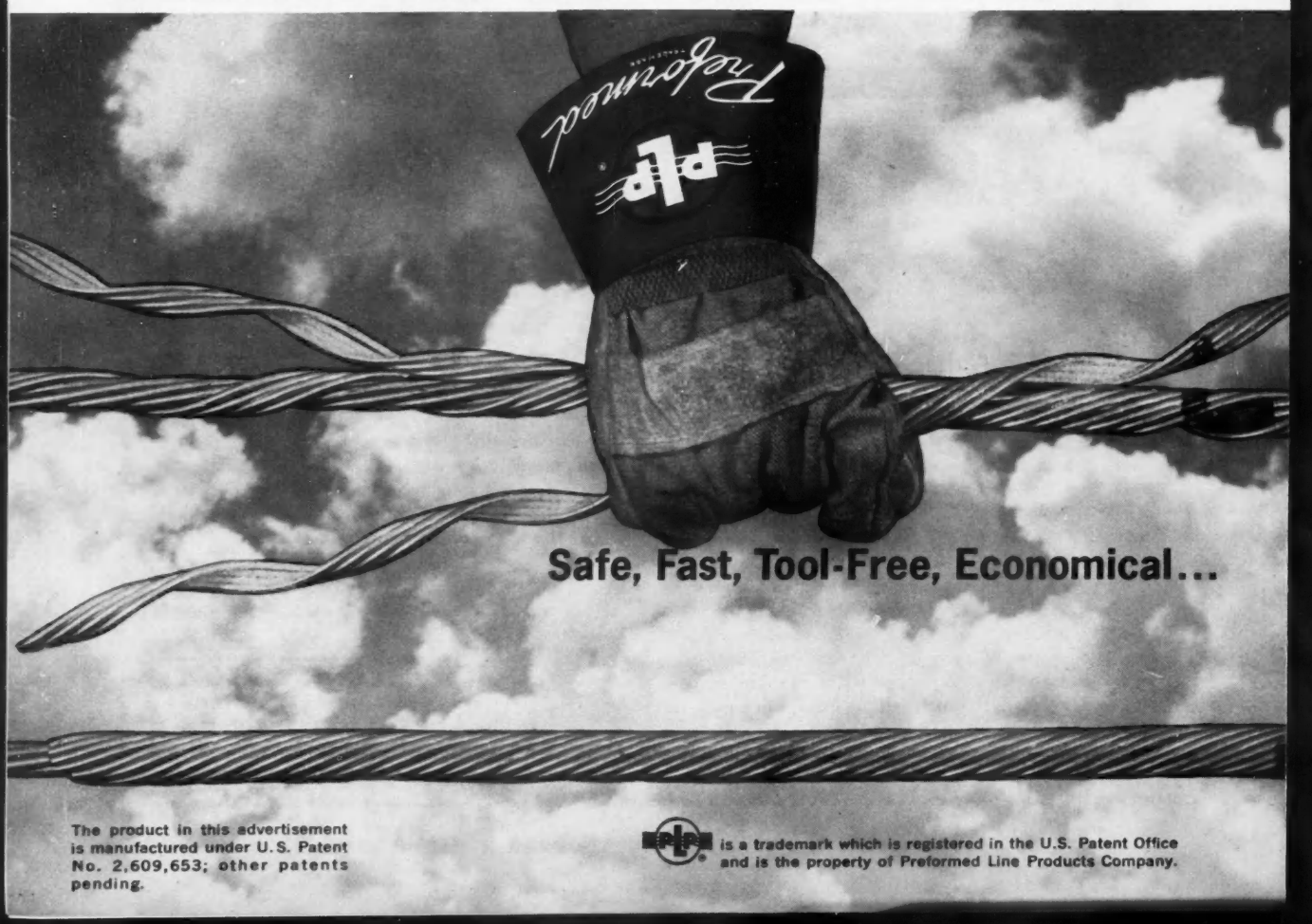
The spectral line width of the output beam is a hundred thousand times narrower than that from other coherent light sources. This property has permitted the observation — for the first time — of difference-signals at radio frequencies between two optical lines.

The ruby optical maser depends for operation on an external bright light to "pump" the chrominum atoms in its crystal structure into an excited upper energy level. These excited atoms then emit their energy as coherent light.

The gas maser uses a mixture of helium and neon gases through which an electrical discharge flows, in the same way as in a conventional neon tube. The energy from the internal discharge excites the helium atoms to a very high upper "metastable" energy level, from which they normally would not radiate energy.

The neon atoms in the mixture collide with the excited helium atoms, and the energy is transferred to them through the collision process. The neon atoms themselves then can be stimulated to radiate their energy on demand in a continuous stream. The beam is reflected back and forth through the length of the gas-filled tube by semi-reflecting end plates, growing in intensity with each trip. Some of the beam is transmitted through the plates, and forms a very narrow output beam of coherent infrared light.

During this stimulated radiation of energy, some of the neon atoms also drop into still lower energy levels, spontaneously emitting the reddish-



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yellow light typically associated with normal neon tubes.

The power required to excite the maser action is in the tens-of-watts range. The output power is in the 1/100th watt range. At this level of operation, the tube is so cool that it can be held in the hand without discomfort. The level of operation can be increased by using larger diameter tubes.

Optical gas masers and optical solid state masers are expected to complement each other in their applications. The latter maser, being essentially a high-power device, will have important uses even if limited to pulsed operation.

Since the neon atoms can radiate energy from almost any one of four upper energy levels to one of ten intermediate levels, up to thirty discrete frequencies can be emitted by the maser, depending on the specific mode of operation. The range of possible wavelengths lies between 9000 and 17,000 A. Present laboratory models have operated at five different wavelengths between 11,000 A and 12,000 A.

The output line width is far sharper than that of ruby masers. The light emitted by the ruby devices is about 60 times narrower than the ruby's normal fluorescence. Normal fluorescence from the helium-neon mixture is already as narrow as that, and maser action narrows the beam more than one hundred thousand times more. Thus, the line is thousands of times sharper than the best spectroscopic lines available in the optical region.

Other gas mixtures are expected to produce different output frequencies with comparable success to that of the helium-neon mixture.

The gaseous optical maser should provide physicists with an immensely useful tool. The narrowness of the line will afford an accuracy hitherto unattainable in spectroscopic work at these frequencies.

Another possible application of the device is the measurement of distances of many miles with extreme accuracy. Continuous optical maser action, moreover, is stimulating renewed interest in the whole field of gaseous-discharge physics.

Super Magnet

SCIENTISTS at Bell Telephone Laboratories have reported finding a way to create enormously powerful magnetic fields for virtually nothing.

On the basis of their findings, reported in *Physical Review Letters* for February 1, an ordinary automobile battery would provide all the electrical power needed to create a steady magnetic field in excess of 100,000 gauss. This would be as strong as any being produced today at a cost of millions of watts of power. A gauss is a unit of magnetic flux density.

The discovery promises important applications in attempts being made to control the power of the hydrogen bomb and in the development of better communication systems.

The basis for the advance was the discovery in 1954 of a compound called niobium-three-tin by Dr. Bernd Matthias, a staff scientist at Bell.

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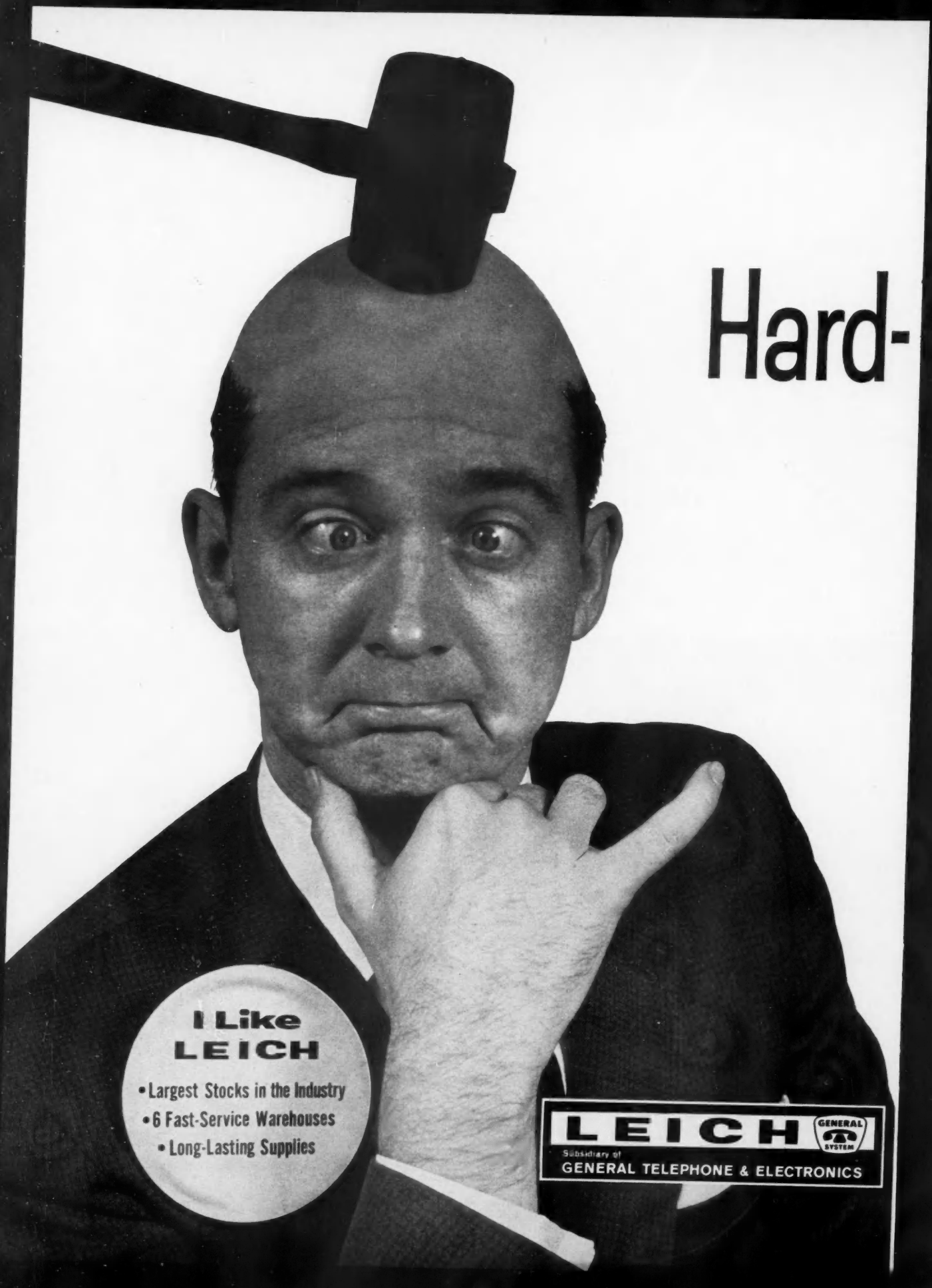
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TELEPHONE ENGINEER
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EDITORIAL

COMMENT

"That Original-Cost Theory"

DURING THE PAST month our file on the *original cost theory of rate making* grew in size and importance due to the Kansas legislature's interest in making *original cost of equipment less depreciation the basis of figuring utility company profits for purposes of rate making.*

Our Kansas file on the subject started building itself many months ago when the Southwestern Bell Telephone Co. asked a rate increase of $5.8 million, using the fair value system, and the Kansas Corporation Commission allowed only $3.5 million using the original cost basis.

The file grew a bit more when the Shawnee County (Kans.) District Court held that the commission should have considered the fair value of the telephone company's property, and the commission promptly appealed the decision to the state Supreme Court.

The proposed Kansas legislation and the attitude of the Kansas Corporation Commission do not, we believe, take into account the fact that the original cost theory of rate making is entirely deficient during a period of rising costs.

In effect, what Kansas is attempting to force upon the utilities operating in that state is a law which says to each utility — "*You can't earn now on what your property is worth, but you can earn on what it cost years ago, and no allowance will be made for the decreased value of the dollar, and increased costs.*"

There is much evidence at hand to indicate the fallacy of such thinking, and to support the conviction that use of the original cost theory of rate making gives no effect to what happens when a telephone company must replace property at costs greatly in excess of the costs of placing the original plant.

It is a well-known fact that when major swings in prices occur, all successful, non-regulated business adjust their prices upward to protect their investors. Why then do certain regulatory commissions and state governments expect and believe there is some magic alchemy by which a telephone company faced with great growth and improvement problems can somehow manage when it is not allowed to earn on the current worth of its investment???

Since telephone companies do not possess such magic, it seems to us that the companies must not only be allowed a more liberal rate of return, but also that such return must be calculated on a rate base which takes into account present-day costs.

Certainly a rate of return based on original cost, even if the latter is brought into realistic proportions, is still not adequate for the reason that such a view ignores the very basis on which the whole matter rests — and that is inflation.

Today, as always, everyone is looking at earnings in the light of current purchasing power of dollars. This is reflected in wages, farm prices and, in fact, under some wage contracts is a basis for adjusting pay for work.

In our opinion it cannot be logically reasoned that the dollars generated or earned in the telephone business differ in any way from the dollars earned in any other business or endeavor.

However, it does seem reasonable that a business should not only generate enough revenue to pay expenses of operation, and a return to pay for use of money, but should also return something above the bare cost of the business in the form of a reasonable surplus.

To accomplish that job, we believe, not only requires increasing the rate of return, but giving reproduction cost adequate recognition in the rate-fixing process.

In Kansas, and in other states, we believe telephone men should press for a showdown on this important problem by calling for a reexamination of the rate-fixing process with a view to bringing yesterday's academic theories in line with present-day realities.

Such a showdown would, we feel sure, prove that the percentage rate of return means nothing at all unless it is calculated on a base that is fair to the company.

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WHICH DIRECTION ARE YOU POINTED?

"Customer oriented" products have long been recognized as an absolute necessity to successful marketing.

"How," you ask, "can the degree of 'customer orientation' of any product be measured?" Quite simply... by the degree to which that product satisfies the demand of customer convenience.

"But," you say, "we in the telephone business are selling a service, not a product."

True... but there is a "product" involved... the telephone.

To the man who pays the bill, the telephone represents your service, your company. It is the only piece of your equipment he sees, handles, personally uses.

The telephone, therefore, performs a vital customer relations function... and only the North Ericofon can completely perform this function!... Why? Because the North Ericofon is the only customer oriented telephone on the market!

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The Ericofon is the only telephone that is a thing of beauty in itself . . . that is not merely an adaptation of a design concept that goes back almost 70 years.

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"Telpak" Tariff Goes Into Effect On Schedule

FCC REJECTS MOTOROLA BID FOR SUSPENSION

American Telephone & Telegraph Company's "Telpak" tariff goes into effect as scheduled on February 16, after the Federal Communications Commission (FCC) rejects Motorola's request for suspension. FCC reserves action on portion of Motorola petition seeking investigation and hearing on new service.

By ROLAND DAVIES and FRED HENCK

THE second major new service offering of the Bell System went into operation February 16, after the FCC rejected a petition by Motorola, Inc., for suspension of the American Telephone & Telegraph Co. tariff covering "Telpak" broadband channels and services. At the same time the commission postponed action — probably for several weeks — on a companion request for a hearing and investigation of Telpak electronics highway service.

Motorola, Inc., had asked for a suspension and investigation of the new tariff on the ground that unless private microwave systems are "comparable in form and price" to the AT&T's new service "both existing and future business will be diverted from the private microwave systems."

The only other filings on the Telpak tariff received by the Commission urged that the FCC let it go into effect. The General Services Administration, while asking investigation of some aspects of the tariff on behalf of the U. S. Air Force, made no request for suspension and pointed to the anticipated savings in government communications costs.

The National Association of Manufacturers' Committee on Manufacturers Radio Use and the American Trucking Associations, in a joint filing, pointed to prospective savings, and requested immediate effectiveness of the Telpak tariff.

Motorola's main contentions in its filing were that Telpak rates appear to be non-compensatory; that the rate structure was established on a competitive basis, raising ratemaking issues; that the Bell System's service has competitive advantages over private microwave systems in terms of being a "package" offer with interconnection permitted; and that to divert additional radio manufacturing business to the Western Electric Co. through the Telpak tariff would raise antitrust issues.

Motorola concluded that "Survival of the telephone company as a nationwide public communications service is not involved here. It is not threatened with severe economic injury to itself or detrimental to the ratepayer. Departure from traditional ratemaking principles and reliance upon such nebulous factors as 'nature of the prospective market' by an extremely healthy carrier should therefore be viewed with the utmost concern by the Commission and should be permitted only on a showing of absolute need.

"There is no emergency revenue requirements on the part of the telephone company which must be immediately satisfied in the public interest and therefore no need to permit the tariff to become effective without the searching inquiry which is warranted by the facts of the case."

In asking for suspension and investigation, Motorola suggested that the FCC inquiry should include "a determination of the basis on which competitive costs were obtained"; "the basis upon which the telephone company in-plant and new plant costs were determined"; "the complete cost relationships between Telpak rates and rates for like and other private line services"; "a determination of whether the general public will be

required to subsidize the Telpak service"; "full exploration of the market data relied upon in determining the 'nature of the prospective market' "; "determination as to whether any Telpak regulations unreasonably restrict or tend to restrict the sale of private communication systems"; and

"The impact of the Telpak offering on the implementation of the Commission's policies looking toward liberalized licensing of private radio communications systems as set forth (in the microwave policy decision), with particular reference to whether or not (the Telpak tariff) is intended to, or will have the effect of discouraging the implementation of that policy, and if so, to determine whether the tariff would create a monopoly in the manufacture and sale of radio equipment and apparatus contrary to the national policy expressed in section 311 and 313 of the Communications Act, and in violation of the federal antitrust laws."

Kennedy Selects Clapp For Top REA Post

NORMAN CLAPP, a former Lancaster, Wisc., newspaper publisher, is President Kennedy's choice as his Rural Electrification Administration chief to succeed David A. Hamil. Clapp, who has worked closely with REA in Wisconsin, has been described as one of the "most effective spokesmen for REA" in that state.

Clapp, a former Administrative Assistant to the late Senator Robert LaFollette, Jr., was Editor of the Grant County, Wisc., Independent for 14 years. He sold the newspaper at the outset of his campaign last year for a seat in Congress, but lost the election in a close race. He is a brother of Gordon Clapp, former Tennessee Valley Authority Board Chairman and General Manager.

Hamil, Colorado state official and legislator who is regarded by Republicans and Democrats alike as having done a very effective job in the REA assignment, is returning to his Colorado ranching business.

In a departing statement, he commented that during the 4½ years he has been Administrator, loans were made to 299 new farm telephone borrowers, and more than 300,000 subscribers received service for the first time.

On the subject of REA, Secretary of Agriculture Orville Freeman said his department is "currently reviewing" the Eisenhower administration's budget proposal for loans funds the REA.

Freeman declared that "We recognize that loan funds for rural electrification and rural telephone must be available in amounts adequate to assure that these programs will proceed on an orderly basis," in reporting the current review of the budget requests.

His policy statement declared that REA "has a responsibility to assist and promote rural telephone cooperatives where necessary to extend telephone service to farmers and other rural people. We expect the rural telephone program to accomplish area coverage telephony to a maximum degree, with emphasis given to the potential which rural telephone cooperatives have to offer. We shall give increased attention to broad economic development of rural areas recognizing the key role of cooperatives to extend telephone, electric, and other services to the widest practical number of rural users."

Pleading opposition to any change in the 2% interest rate for REA loans, Secretary Freeman also commented that "We expect to have an Administrator in whose judgment we shall have sufficient confidence that he may be delegated authority to evaluate and approve individual loans in accordance with the Rural Electrification Act and with the general policies, rules, and regulations established by the Secretary and the Agricultural Credit Services."

BDSA To Study So. American Countries

IN A move aimed at bringing more business to United States' manufacturers of communications equipment, the Communication Industries Division of the Business & Defense Services Administration, U. S. Department of Commerce, has launched a survey of 23 Latin and South American countries to determine the potential for telecommunications equipment sales by the U. S. firms.

As part of the study, a Telecommunications Advisor will tour the area and spend an average of one week in each of the 23 countries involved.

Surveys covering several industries are to be carried out by BDSA in this new approach to furthering the government's national export expansion program, and the one for communications will be the first one launched.

The information gained from the telecommunications survey will be disseminated to a number of U. S. government agencies, and reports will be prepared for the communications equipment industry. BDSA said that the information is expected "to improve the competitive position (of U. S. manufacturers) in the Latin American market and thereby expand this country's exports."

During his tour, the Telecommunications Advisor will assist U. S. embassy officers in the various countries in discussions with local telecommunications officials and in the preparation of reports.

One aim of the survey will be to attempt a forecast of the scope and nature of the Latin American telecommunications market for at least the next five years, and to determine steps necessary for a successful export trade position in such a market.

It is likely that at the completion of the Latin American study — scheduled to start in the near future and to require more than a half-year — similar surveys will be conducted in other parts of the world, notably in Africa and the Middle and Near East. The BDSA program has been aided by recent informal meetings of representatives of seven government agencies with an interest in the subject. This telecommunications export expansion committee has helped explore the steps to be taken in developing the program.

—Roland Davies and Fred Henck.

PLANNING FOR MANAGEMENT

USITA'S MANAGEMENT DEVELOPMENT PROGRAM

• The author attended the 3rd annual USITA Management Development Program at the University of Kansas. Here is his report on a USITA sponsored program designed to help the participating executives do more effective jobs in their current positions and help them prepare for more challenging responsibilities.

By MITCHELL N. DREW*
President, Quincy (Fla.) Telephone Co.

I WAS fortunate enough to attend the 3rd annual USITA Management Development Program at the University of Kansas last summer. This school is just one of those held by, or sponsored by, our national association from time to time to help with the problem of management training.

The objectives of this particular school were to help the participating executives do more effective jobs in their current positions, and to help them prepare for more challenging responsibilities.

There were 46 of us who attended the school. They came from such geographical extremities as Tallahassee, Fla., and Everett, Wash., from Winthrop, Maine, and Honolulu. They came from Santiago, Chile and San Juan, Puerto Rico.

Our classmates represented all the various divisions found in any company. Traffic, Plant, Accounting, Commercial and Engineering were all there.

And I think *this* was the source of most of the benefits of the school. When telephone people get together — they talk, and talk we did, at Lawrence, Kansas, last summer. We discussed ideas at great length on the subjects which we studied — but we discussed also those problems of our business about which we had no formal instruction. And it was *helpful* — as an exchange of ideas always is.

Differences in policy and practices were most apparent between the large companies and the small companies, as it would be easy to guess. There were many ideas expressed on merchandising, labor, D.D.D., radio and its applications, and many other items.

Promotion To Management

PROBABLY one of the most revealing differences was the practices followed by the large companies and the small companies in the matter of promotion to management.

The large companies, of course, followed a set pattern developed and used through the years, and proved as the most productive and most reliable. There was revealed to us also an example of small company planning in management promotion. It seems that in a very small company the president called in a young lineman who, to say the least, had proven very satisfactory in that particular job.

The president complimented the lineman at great length on his *ability*, his *loyalty*, his *attitude*, and many other virtues. He concluded by saying that he was going to give the young man an on the spot promotion to executive vice president of the company.

The young lineman was equal to the occasion and his

Mr. Drew presented this paper at the 1960 convention of the Florida Telephone Association.

reply was simple and to the point — He said; *"Gee thanks, Dad!"*

The students represented companies from as few as 2,500 telephones in service up to the giants such as General and Bell. As a matter of fact, the General group had the largest delegation at the school.

Of course, the *real* meat in the account in this school was the formal instructions which we received. This was, financially speaking, a rather expensive school for us to attend. Counting the school fee, the time away from our regular jobs and other expenses, it mounted up. But I can say with all sincerity that *each* of the courses offered to us was *individually* worth to me and to my company the total cash outlay needed to send me.

The program was very informal, most of the class sessions were conducted in a group discussion manner.

Each course was taught by the case study method. A case is a situation; facts are presented which give necessary or desired background to some problem which may or may not be clearly spelled out. Beneficial discussion in class required that the participants be fully familiar with the facts of the case.

Therefore, the case and other readings on the area involved were read by the students in preparation the evening before the case was discussed in class. I might add that this prevented any serious or prolonged dedication to the likes of the Hospitality Rooms opened for us by our host companies.

The courses we had were as follows: Control or (Accounting); Human Relations; The American Business Economic Climate; Marketing and Administrative Policy; and Law (Rate Matters).

Quite frankly, I'm not sure which of the courses could be considered most worth while. I'll try to give you a short resume of each so that you can get some idea of the details covered.

Control and Financial Administration: — In this portion of the course attention was devoted to the purposive use of accounting data for the control of current and the planning of future operations of the firm. There was some presentation of conventional accounting procedures and techniques, but the focus was on management's *use* of figures in decision making. Similarly, there was some exposition of financial terms and devices, but the point of view was that of the manager being faced with the question of what funds are needed and alternative sources of these funds.

As indicated, a substantial portion of the study consisted of the analysis and discussion of actual business situations, drawing upon illustrations both within and without the telephone industry, and included such topics as management accounting, cost control, budgeting, and analysis of capital requirements.

Human Relations In Business: — Here, the basic premise was that a major factor in any administrator's success is his ability to deal effectively with subordinates, colleagues, and superiors. It is further assumed that to work effectively with people on the job, the administrator must be able to understand something of the behavior of his associates and to be an effective link in the organization's communications system.

Experience indicates that these abilities are not automatically attained by the acquisition of substantive knowledge or the memorization of a set of rules. Instead it is believed that these skills can only be acquired by patient and intelligent practice.

Here, the cases used described concrete business situations in which the human factors present problems of management. Through the analysis and discussion of these cases the participants had an opportunity to practice these skills and to test them out among their colleagues and instructors. The cases used portrayed situations such as communication failures, resistance to change, staff-line problems and small work group relationships.

Merchandising: — The sessions dealing with merchandising were devoted to a consideration of problems of pricing, advertising, sales promotion, market analysis, and product selection. In addition to these specific problems, attention was directed to the proper place of the merchandising program within the total company operations. Extensive materials describing actual telephone merchandising techniques were used in addition to cases drawn from both telephone and nontelephone industries.

Administrative Policy and Planning: — The materials used in these class meetings were of such a nature as to integrate the other areas of the program into a meaningful whole. These cases were broad enough to cover several fields, such as finance and marketing, and organization and production.

In addition to integrating the various functional areas within the enterprise, this section of the program was aimed at integrating the firm with its environment. Cases and discussion materials were drawn from a number of industries, both telephone and nontelephone. Specific topics considered were, planning function, anticipation of future developments, determination of objectives, and design of organizational structure.

The American Business Economic Climate: — This area was designed to help the administrator understand more about himself and the problems of his work by relating each to his society. This was a focus on the development of the whole (local, regional, and national) community. Without such a focus, it is believed, the administrator often tends to see himself and his firm in splendid isolation. He fails to understand how he is molding society and how simultaneously society is molding him.

It introduced this conception of the administrator with a series of interrelated lectures concerning economic, political, and social environment with such history as is necessary to understand the character of contemporary society. A syllabus containing an outline of each lecture and the limited reading necessary for extending the area of learning was used.

Rate Regulation and Law: — This area was

Please turn to page 63

SUB-HARMONICS and OVERTONES

By C. D. EHINGER
Pres., Citizens Telephone Co., Decatur, Ind.

Methods Of Measuring "Return Loss"

A SIMPLE DESCRIPTION OF "NET LOSS"

In this two-part article, the author uses a simple analogy to describe "return loss". Actual measurements of such loss are also made on a test circuit and a complete description of the method, results, and equipment required is also given.

BASED on the number of inquiries which are received and the interest shown, it would appear that some confusion exists as to the meaning of "return loss" and methods to be used in measuring such "return loss."

In previous articles titled "A Fundamental Approach to VNL," which appeared in the June 1, June 15, July 1, and July 15, 1960 issues of *Telephone Engineer and Management*, reference and explanations were made concerning talker's echo, listener's echo, and singing. (Editor's note: reprints of these articles are now available from *Telephone Engineer and Management*.)

"An Absurd Analogy"

PERHAPS a somewhat ridiculous and absurd analogy will help to clarify the meaning of "return loss." Let us assume that I have a large, metal tank open on one end with the opening covered with wire screening. Let us further assume that I wish to fill this tank with water by means of spraying water into it, through the wire screen, by the use of an ordinary garden hose.

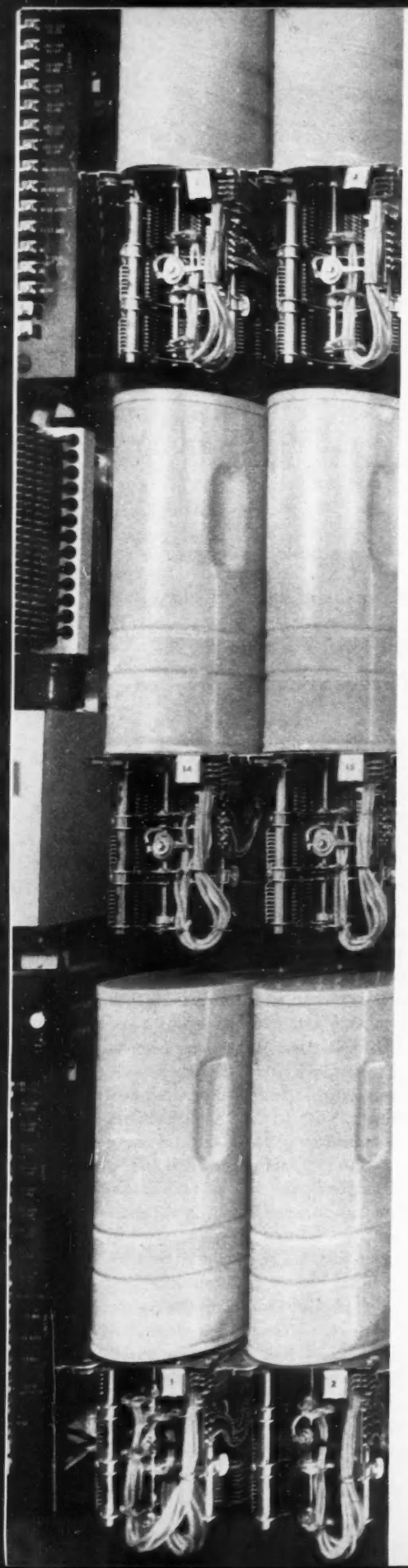
If I stand directly over the wire screen and adjust the nozzle of the garden hose so that only a small amount of spray comes from the nozzle, I can direct the spray onto the screening and into the tank in such a way that all of the water is caught in the tank.

As an example, let us say that I spray exactly 100 gallons of water out of the garden hose. Upon measuring the contents of the tank, I discover that there is exactly 100 gallons of water in the tank. This would be a case where I have accomplished 100 percent transmission. Every bit of water leaving the nozzle of the garden hose has reached its desired objective, the tank, and not a bit was lost during transmission from the garden hose to the wire screen covering. In this case, it is obvious that the impedance presented by the wire screening presents a "good match" to the stream of water, at the velocity used.

Now let us assume that I turn the nozzle of the hose in such a way as to cause the water to gush forth at maximum speed and at maximum force. I now have a different situation than the previous one. I can notice that some of the water is not going directly through the screen wire. Small eddies, whirlpools, and other phenomena occur to cause the water to seem to have a harder time penetrating the screen.

In fact, some of the water bounces directly back from the screen wire to where I am standing. A small amount diverts in other directions. After allowing 100 gallons of water to go through the garden hose, under these conditions, I again measure the amount of water caught in the metal tank. I find that only a total of 60 gallons have been caught by the tank.

In this case, I have lost 40 gallons of water and instead of 100 percent efficiency of transmission of water, as in the first case, I now only have a 60 percent efficiency of transmission. This was caused by the fact that the screen no longer presented an impedance to the flow of water which



"Yes, Frank...

we can help you finance

Financing is an important consideration to the buyer of dial equipment. That's why George Summerscales* is always ready to explain how to finance the purchase of Strowger Automatic...

Some of George's customers want to borrow money from a local bank. In this case, George helps the customer assemble a strong story which demonstrates Strowger's proven record for quality and dependability—a record that can't be challenged by lending agencies.

Other customers prefer to apply for a loan under the Automatic Electric Finance Plan. In this case, George explains how the plan works and helps the customer make out an application form.

Are you planning a dial conversion? If so, get in touch with us. We'll send *your* AE representative in to help you solve your dial conversion problems. He can help you apply for a local loan—or explain the AE Finance Plan. To contact your AE representative, just write Automatic Electric Sales Corporation, Northlake, Illinois. In Canada, Automatic Electric Sales (Canada) Ltd., 185 Bartley Drive, Toronto 16.

**District Manager, South Central District, Automatic Electric Sales Corp.*

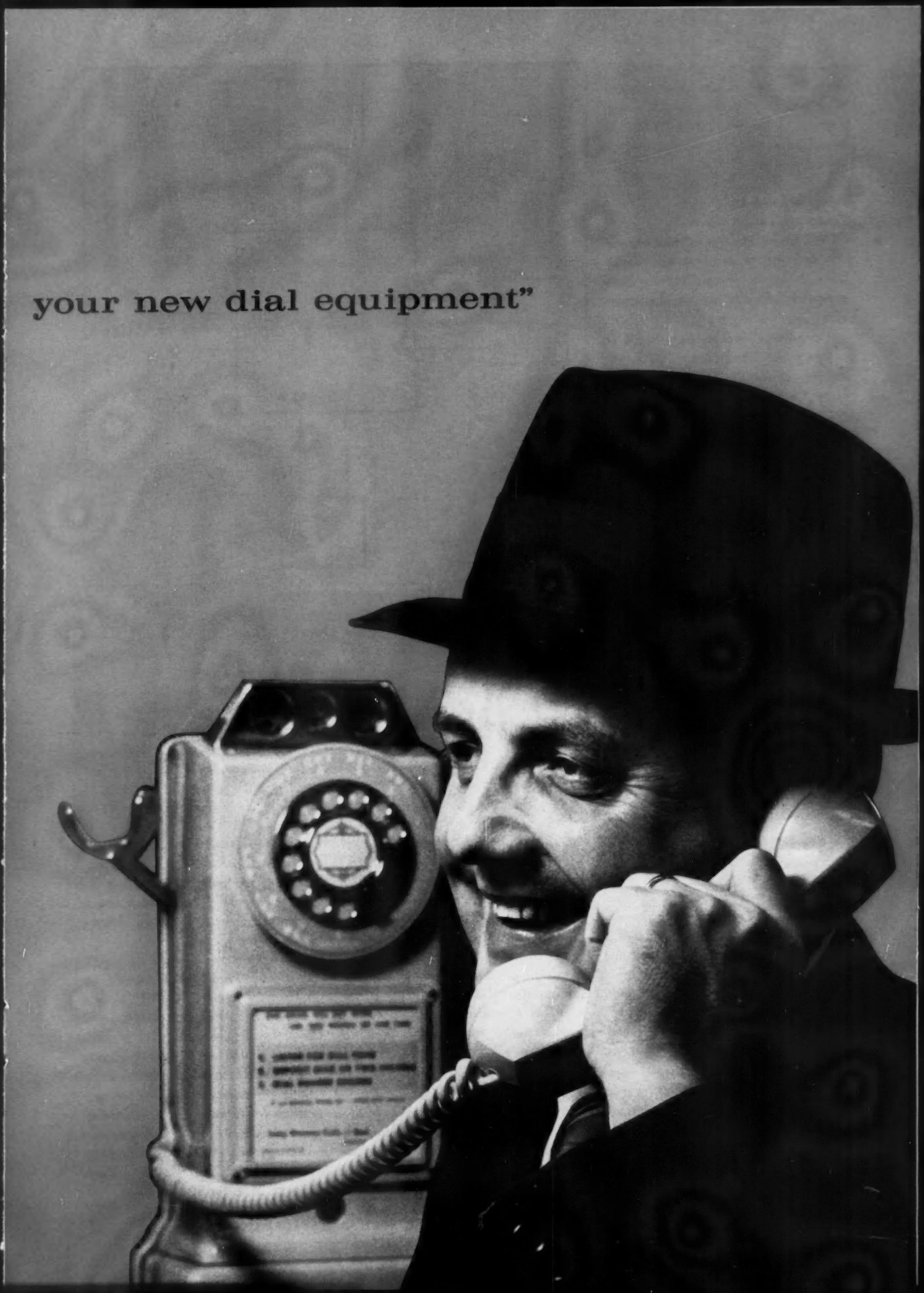
AUTOMATIC ELECTRIC

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

your new dial equipment"



would allow perfect "passing through" or "absorption" of the water. Instead of passing through the screen, a major portion of the water was "reflected back" toward the originating spot — the garden hose.

Return Loss In Communication Circuits

THE above analogy is rather crude and may or may not serve to illustrate what happens when we have reflection losses in our telephone circuits.

In communications, we attempt to obtain every bit of energy, at the receiving point, that was transmitted from the sending point. Obviously, we do not arrive at this happy result since we have two factors which enter into the picture. We have ordinary losses which attenuate the signal. These losses are the consummation of the energy by the transmission line itself whereby the energy is dissipated in the form of heat.

We have the second case where impedance irregularities exist and portions of the energy are "reflected back" toward the transmission point. It is obvious that if I send out energy from a point and 10 per cent of the energy returns to me, I cannot possibly have transmitted more than 90 percent of the original energy to my destination point.

The concept of "return losses" on communication circuits seems to be greatly misunderstood, or not known at all. At the risk of being very repetitious, I wish to restate the premise made in the preceding paragraph. Whenever I have a circuit, for communication use, I attempt to send energy from one end to the other. The ideal condition would exist if I could send energy into the line at one end and receive every bit of that energy at the distant end. This would be the case when I had a "loss-less" line sometimes called a "zero-loss" line. In actuality, no such line exists.

Some energy is lost in the components of the circuit in the form of heat. Other energy, at high enough frequencies, radiates off of the line and into space. A portion of the energy may hit impedance irregularities, along the line or at the terminating point, and "bounce" back toward the originating end. It is this last case which we are discussing and is the item termed "return loss."

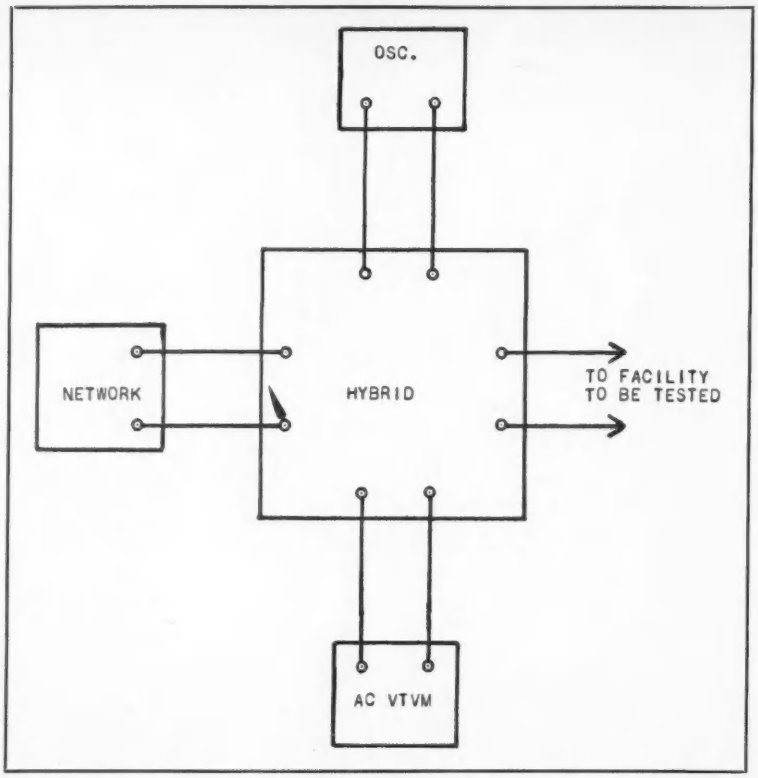


FIGURE ONE.

The reduction of "return loss" to a minimum on our circuits is of utmost importance. I believe that it is obvious that a circuit with the minimum of "return loss" has the maximum chance of performing at highest efficiency or, in other words, giving us the best transmission quality from one point to another from the standpoint of "transmission level."

Perhaps an even more important consideration is involved when the circuits are to be used in connection with voice frequency repeaters to overcome attenuation inherent in the circuit. As pointed out in the series of articles concerning VNL, return-loss is also a primary consideration with talker's echo, listener's echo, and singing.

All of these factors have become far more important to us as more and more circuits are used for toll machine-switching with no human selection involved. Exactly the same points are also valid concerning our carrier circuits where return losses must also be kept to the minimum in order to have stability.

It may be that, to those of you who have stuck with me this far, I have made the point just as *clear as mud*. If so, my sincere apologies, for it then means that I have attempted to explain something and have completely failed to clarify it for you.

Perhaps a better means of explaining return loss is to go through the details of methods of measuring return loss, actually make some return loss measurements, and then discuss the point further.

The equipment required for return loss measurement is quite simple. An oscillator, a sensitive AC VTVM, and a hybrid coil is all that is necessary for such measurements. The generalized test set-up can be seen in *Figure One.* (*To be concluded in next issue.*)

Any comments, criticisms, or suggestions for future topics? Address all correspondence to "Sub-Harmonics and Overtones," "Telephone Engineer & Management," 7720 Sheridan Road, Chicago 26, Illinois.

U.S.I.'s custom engineered . . .

Type 40A - Floor Mounted

Type 40B - Floor Mounted

A complete system designed and engineered to your requirements, offering unlimited capacities with cord or cordless attendant's switchboard or inward dialing, is available for your subscriber needs. Efficent, modern design and overall economy of operation, assures lasting satisfaction. We're available at Charlottesville 3-5153. Call or write for your copies of Catalogue P60F6.

USI CORP.

UNITED STATES INSTRUMENT CORPORATION

CHARLOTTESVILLE, VIRGINIA

TRAFFIC LIGHTS

By D. A. PERIGO
General Traffic Supt., West Coast Tel. Co., Everett, Wash.

Interspersed Information Records

SEARCH TIME MAY BE REDUCED

A company's first problem is to decide whether it should intersperse or continue listing exchanges separately. Other problems concern: timing of the changes; how many frames will be needed under the interspersed plan; and proper handling of the mechanical details.

WE RECENTLY received a letter from a chief operator seeking advice on how to go about interspersing Information Records. It has occurred to us there may be other companies where there is a search time problem which interspersion might help.

In discussing interspersed Information Records I must limit myself to generalities and guides. To do otherwise with a complete lack of knowledge of the company's particular operations would certainly be presumptuous of me.

I think the company's first problem is to decide whether it should intersperse or continue with exchanges listed separately — and also whether it needs complete interspersion or perhaps only two or three exchanges. Some ideas on this appeared in *Traffic Lights* in the August 15, 1959 issue of *Telephone Engineer and Management.*

The second problem concerns the timing of the change. The best way (most economical) to do the job is when it is necessary to increase the number of appearances of the information records. This is because the additional record must be typed and because it will not be necessary to buy quite so many additional frames. If such an addition is within the next two years I would become thoroughly prepared — then wait until the addition.

The third problem is to decide how many frames will be needed under the interspersed plan. I suggest that if the company is just riding along with a nominal growth, that it start out with the frames about 65% filled. But if the company is having substantial growth, figure the requirements on the basis of 50% filled. This may seem like a lot but it will save time, money, and headaches later. When the number required has been determined, deduct from this the number on hand, and order the difference.

The company should have an adequate supply of new insert strips — and this leads to the fourth problem. If all exchanges have prefix names (or numbers are on All Number Calling) it may be possible to re-use some strips, since this may satisfactorily establish the address. If one exchange is much bigger than the others a lot of typing time can be saved by omitting the address of the large office. For example, if R-ville is the largest, the listings might look something like this —

Smith, J. B. 623 Main A-ville JA3-4657
Smith, John B. 125 Locast . . PI2-5642
Smith. Jonathan 746 Main
B-ville AL9-6262

The *absence* of the city name means it is R-ville. If prefix names (or numbers) are not used, then the office name is on each strip.

There are other complications to watch for also. If there are overlapping conditions, extreme care must be used. For example, the company might have a subscriber living in one exchange whose post office address is another. If there are no prefix names a listing might be like this—

Bell, John A. Box 579
R-ville . . . . . A-ville 6572

If prefix names are used it would be—

Bell, John A. Box 579 . . . . JA3-6572

Remember, *the absence of a Post Office says it is R-ville.*

The next problem is the typewriter. It is going to take a real beating — so make sure it is in top condition. If some of the listings will be re-used, the same kind of type should be used. If new listings are going to be made, give a lot of consideration to the kind of type you have on the typewriter. The manufacturer of the in-

sert strips can make suggestions on this item.

Now comes a real serious problem. When are you going to do the job? You can't do it when a rotary is in use without seriously impairing your service. I recommend that, if working rules permit it, the job be done at night. If done this way you will not interfere with the service and your typist can make much better time. If it cannot be done this way perhaps you can arrange to have it done early in the morning and late in the evening. This may require the use of two part-time typists instead of one — which, of course, means double training and the supervision will take twice as much of your time. As an alternative you might use one part-time in the period where you have the most hours available and spread the job over a longer period of time.

A question which always comes up is, *"How many listings can a typist do in an hour?"* — and this one I refuse to answer because of all of the variables of the listings themselves, the working conditions, etc., to say nothing of the individuality of typists. All I can say is that you should do some experimenting and counting to arrive at your own figure.

In spite of what has been said about doing the work in the off hours, there will still be difficulties because over a period of time your information operators will be working with both interspersed and segregated listings. If there is some confusion during this period I hope both operators and supervisors will be patient.

Just two further words of advice: — First, don't expect your information operators to be able to find their way around in the new files without being trained. Explain before you start the job — then when the first frames are ready show them how to use the new method.

The second word of advice is — don't think you can carry the plans around in your head by having this article for reference. Write out your entire plan from beginning to end. Put it in your desk drawer for a couple of weeks — then read it over

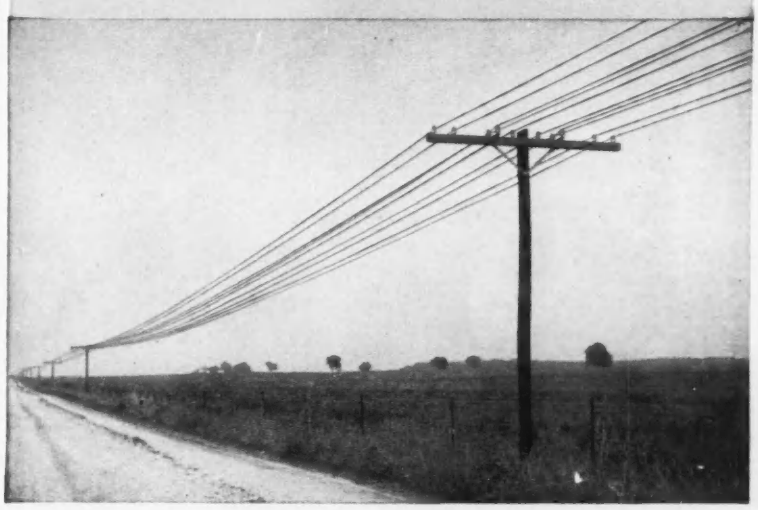
Crapo HTL-135

High Tensile Line Wire

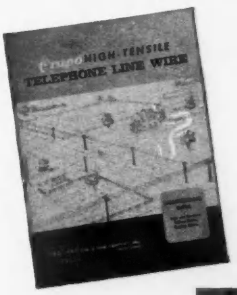
MADE TO WITHSTAND HEAVY STORM LOADS

Time and time again, *Crapo* HTL-135 has demonstrated its ability to stand up under heavy ice and wind loads when other conductors failed. This can be attributed to the fact that *Crapo* HTL-135 combines high strength with high fatigue endurance plus superior elastic qualities which enable it to spring back into place when loads are removed. The result: service interruptions are minimized, re-sagging is seldom necessary, where this rugged telephone wire is used.

The excellent telephonic transmission characteristics of *Crapo* HTL-135 make practical subscriber loops of 14 to 15 miles with normal voltages and equipment. Longer loops are possible where higher voltages and more sensitive telephone sets are employed. For dependable, long-span, low cost rural lines, specify *Crapo* HTL-135.



HERE'S PROOF OF DEPENDABILITY

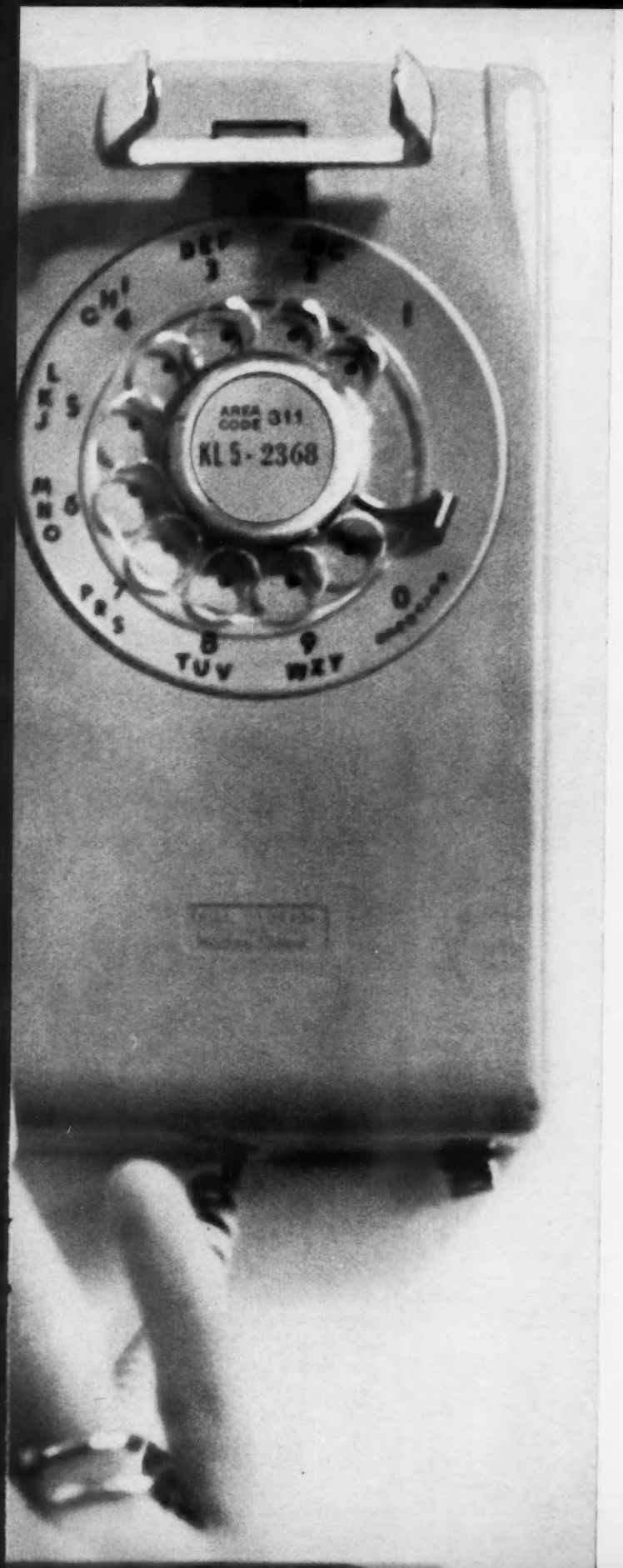


The **Crapo** HTL-135 in this typical rural line of 300-foot spans was subjected to two heavy ice storms within 14 months. This photo shows the line, without resagging, three months after the second storm.

Write for Manual TM-59 containing complete engineering data!

Crapo HTL-135

INDIANA STEEL & WIRE CO., INC.
Muncie, Indiana



"Not for you, darling... this is Jane"

That's the headline, and here's the illustration, of a current Bell System national ad on the telephone's value.

The purpose of the ad is to change some husbandly minds on the subject of their wives' telephoning.

We submit that such talk on the phone is *not* mere chatter. Most ladies exchange vast amounts of useful, practical information by phone—information that often directly benefits the head of the house.

We hope the ad will prompt millions of men to pause, reflect and ask themselves some questions. For example:

Come to think of it, where did Anne find out about that terrific freezer sale?

For that matter, where did her new cake recipe come from?

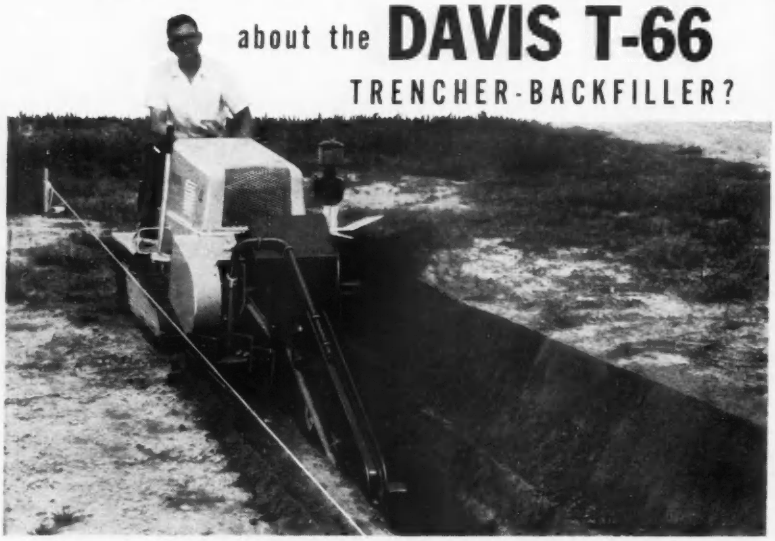
That swell book I'm reading—how'd she hear of it?

Is it true, as she says, that the phone is one of her biggest helps in getting things done and keeping track of what's going on?

And what about the reaction of our women readers? We think the ad will bring every one of them to her feet cheering.

BELL
TELEPHONE
SYSTEM

Why are owners so enthusiastic about the DAVIS T-66 TRENCHER-BACKFILLER?



Because it outperforms any other trencher in its class and does its own *BACKFILLING* to boot!

Enthusiasm is the result of profits... and that's what the T-66 produces. It not only digs with amazing efficiency in the toughest soil conditions... but finishes up where others leave off—by backfilling. Ground-gripping traction for accurate ditching control and backfilling power is attained by large track shoes, a unique hydraulic drive, and the T-66's extra-heavy 1400-lb. weight. No erratic rubber-tire bounce. Hydraulically controlled boom lets you govern digging depth and handle the backfill blade with ease. Digs 4" wide, **66" deep** or **12" wide,** 30" deep and at varying widths and depths in between.

Special Attachments for 16" Trenches and Flush Digging

These special attachments open the door for jobs previously reserved for larger, more expensive machines. Handles 16" trenches down to 24" deep with ease... or flush digs alongside walls or fences.

the DAVIS HUSTLER UTILITY TRAILER

This 2000-lb. capacity, tilt-bed trailer for the T-66 and other loads has low center-of-gravity stability and load equalization suspension system. Sides optional.

the DAVIS PUP TRENCHER *Self-Propelled*

Digs by itself. This self-propelled trencher is driven by a six-speed winch mechanism. A productive tool for trenches 2"-3" wide to 36" deep, or 4" wide, 18" deep.

A REAL BACKFILLER

Heavy-duty, 42" blade attaches to boom in less than 5 minutes. Blade can be set straight or angled left... raised and lowered hydraulically. Nimble maneuverability — no sluggish gear shifting — because of Instant Forward/Reverse. The T-66 as a backfiller is not an afterthought... it's designed that way.

We Welcome Competitive Demonstrations!

Owner's enthusiasm creates confidence that invites comparison. See why the T-66 is the new standard of values for trenchers. It's built by men who are leaders in the design of ditching equipment. **Ask about the T-66's 90-day unconditional guarantee.**

DAVIS MFG. INC.
1514 S. McLean Blvd., Wichita 13, Kan.

Please send me descriptive T-66 literature and the name of my DAVIS dealer____. I am also interested in the Davis Pup____ Davis Hustler____.

NAME_____

ADDRESS_____

TOWN_____ STATE_____

D1-261

and revise it with your new ideas on the subject. There is no substitute for good planning. Without good planning the boss is going to ask why it cost so much more than you told him it would.

There is another point to be considered in connection with making any kind of a change in your information arrangements. Except for very unusual circumstances a small operating unit is inefficient and costly — and by small we mean where the busy hour requirements are less than twelve operators. There are many cases where a company may be better off if it can arrange to have a neighboring company provide the Information service. We are moving toward Centralized Information Bureaus by Numbering Plan Areas. With this arrangement and a universal code (area code+555+1212) DDD subscribers will be able to call NPA Information centers anywhere in the country.

If you have not been informed of this plan in your area be sure to check with your Bell Associated company before spending any money to set up an Information service that may soon be unnecessary. — *D. A. Perigo.*

Line Coupling Network

NEW DATA is available from Lynch Communication Systems, Inc. on its Type F1125 Line Coupling Network designed for telephone and telegraph company central office installation.

The Lynch F1125 Line Coupling Network is a line filter set for use in systems where extensive carrier growth is not anticipated or required. It does not require the use of an external carrier frequency repeat coil for longitudinal blocking.

The unit is used to separate the voice frequency circuit from carrier telephone and telegraph circuits operating in the 12-65 kc frequency range. It has a crossover frequency of 4.5 kc.

Literature is available on request from: *Lynch Communication Systems, Inc., 695 Bryant Street, Dept. TE&M, San Francisco 7, California.*

New Products' Showcase

SUPPLIES And EQUIPMENT

By DICK REYNOLDS

Radiotelephone

AC SPARK PLUG, the Electronics Division of General Motors, has announced a new four-channel, 150 Mc, mobile radiotelephone designed specifically for common carrier use.

Called "AChieverfone," it has been designed and packaged into two compact units, the control head and the receiver-transmitter (R-T) unit.

The control head can be mounted on top of the dash, under the dash, on the transmission hump, or in a number of other places, such as the glove compartment. The R-T unit is slipped onto a base plate which is mounted on the trunk shelf or other location, and locked with a locking lever. Another feature of the R-T unit is that it may be mounted horizontally or vertically.

The receiver is a fixed tuned, double-superheterodyne, FM configuration tunable over the 144 to 174 Mc frequency range. The transmitter produces a radio-frequency rated power output of 22 watts. It can be tuned to any frequency in the 144-174 Mc region and maintains its (unmodulated) carrier frequency within 0.0005 per cent under all permissible operating environments.

The receiver-transmitter unit of AChieverfone takes up a minimum amount of space. As shown above, the R-T unit can be fitted into most auto trunks without interfering with any baggage space. Combined in this miniaturized unit is a four-channel receiver and transmitter and a selective signaling decoder. The control head and hand-set may be mounted on the instrument panel, transmission hump, glove compartment, or virtually any area inside the car.

Through the Achieverfone system, telephone calls may be placed or received by radio through the public land line telephone system.

The power supply is a high efficiency, transistorized device which provides B+ plate voltages for both the transmitter and receiver. It is a transistorized DC to DC converter which changes the 13.6 VDC power from the electrical system of the vehicle to the higher voltages required to operate the receiver-transmitter.

Selective calling of mobile telephones is accomplished by means of two-tone sequential audio modulation of the radio-frequency carrier. The decoder is a transistorized electromechanical device, and can be set to respond to any pre-selected call number chosen out of more than 51,000 available five-digit codes. *Check NP* 575.

Cable Layer

THE KELLEY Products Division of Crutcher, Rolfs, Cummings, Inc., has announced a cable laying attachment for all models of Caterpillar

track-type Tractors equipped with a Cat hydraulic control unit.

The new unit lays any cable or

wire up to 3½″ O.D. at depths ranging from a 12″ minimum with the Cat D4 to a 72″ maximum with the Cat D9 Tractor. The laying shank is far enough behind the tractor to permit unrestricted maneuvering without deviating from the cable line, yet close-coupled enough to provide control of depth and position.

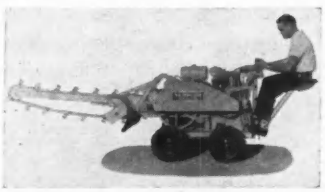
Vertical movement of the tool bar is attained by two 7″ hydraulic cylinders with 48″ stroke. Lateral movement, also hydraulically controlled, permits offset laying within 24″ of paving, buildings, abutments, shoulders, culverts, bridges, etc.

Shanks are available in a variety of cable-matching sizes and widths to reduce drag or line pull and possible damage to the cable. Shanks are of high-alloy, wear-resistant steel with replaceable leading edge and point. The cable guide or conduit, attached to the ripping shank with hardened pins, opens for easy removal or insertion of cable. A roller section, at the bottom of the conduit, guides the cable into the channel created by the shank with the very minimum of drag, bending and friction. Cable pull rarely exceeds 100 lbs. with the cable layer though cable is designed for a much higher load. *Check NP* 576.

New Vermeer Ditcher

THE VERMEER Manufacturing Co. has just announced distribution of a new model, the W-1 Pow-R-Ditcher. The new unit digs up to 8″ wide and is the smallest Vermeer ditcher.

The unit features all-hydraulic ground travel, and has a 4 wheel drive on 4.00x8 tires or is equipped with



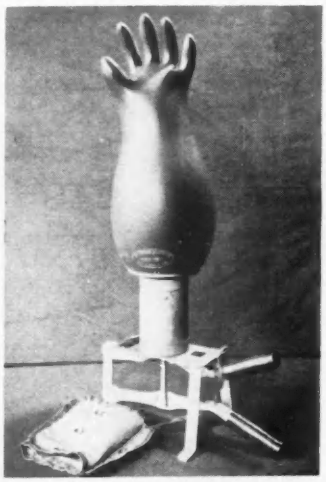
crawler tracks. It is powered by a 9 hp. Wisconsin AENL engine.

Special ejector paddles allow dirt to be deposited neatly on both sides of the ditch rather than thrown over a wide area. *Check NP* 577.

Glove Tester

NOW LINEMEN'S gloves can be tested right on the job, with the E. D. Bullard Company's New/Matic Portable Glove Tester.

The glove is clamped over the top of the tester, hand inflated, and in-



spected. The tester comes in two sizes to fit all linemen's standard rubber gloves. *Check NP* 578.

Activerter

THE Activerter, a development of The Electric Storage Battery Company, provides 110 Volt AC power any place a 12 Volt battery is available or can be taken. It can be used to operate electric power hand tools, regular electric light bulbs, electric blankets, radios, TV sets, hand vacuum cleaners and many other electri-

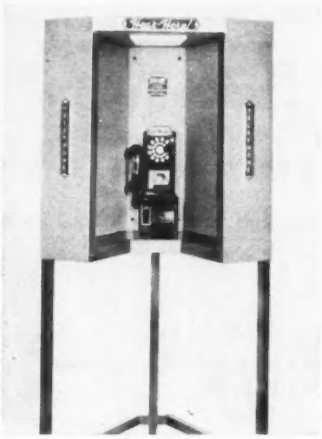
cal devices that do not exceed the wattage output of the Activerter. The ESB Activerters are available in four models with from 150 to 500 Watts output.

In addition to converting 12 Volt DC to 110 AC, with the flick of a switch the unit becomes a fast or slow charger for 6 and 12 Volt batteries. Units are fully transistorized to reduce weight, and there are no moving parts or vibrators. *Check NP* 579.

Acousti-Booth

SPECIAL acoustical treatment of inside wall and ceiling panels of the No. 45 Acousti-Booth has been announced by Burgess-Manning Co.

Because of this acoustical treatment, telephone conversations are private and undisturbed by noise. Voices inside the booth are not heard outside. Outside sounds are muted so



that they do not interfere with hearing inside the booth.

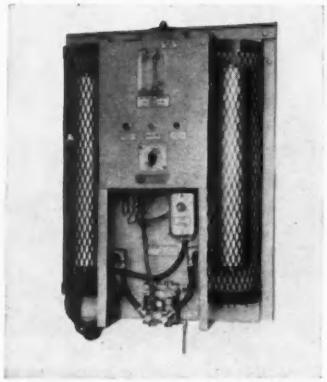
Of welded steel with silver-gray hammered finish, the booth is without doors or moving parts of any kind to be maintained. Only wiping with a damp cloth keeps it clean. The unit may be installed either free-standing on steel legs or wall mounted with special brackets. *Check NP* 580.

Air Dryer

S & G MANUFACTURING Corp. has recently announced the availability of a new Air Dryer for instruments and pneumatic controls.

This unit features (1) only one control valve, (2) dessicant towers, (3) cycle timer, check valves and the purge meter. The use of the purge meter with the check valve eliminates three or four solenoid valves which are usually found on dual tower dryers.

The design of the purge meter also has a visual Tel-Tale indicating Silica-Gel for safety which will change color when the humidity of air increases.



Other safety items are included such as pilot lights, guard lights and low amperage fuses.

The Instrument Air Dryer is completely automatic and is a wall mounting type. Many other size units are available from .5 CFM to 10 CFM.

Dry air supply from the dryer is a continuous process and, on tower changing, only seconds are required for changing air flow to opposite tower. *Check NP* 581.

Two-Way Radio

GENERAL Electric has developed a new line of two-way radios, using vacuum tubes and simplified circuits.

The G-E Pacer has 15 tubes and 2 transistors. When the 15-watt unit is "on," battery drain is 4.2 amperes. This is a full ampere less than 10-watt tubed units now available in the industry. Thus, the new equipment

provides more power and more communications range with less battery drain. Special generators and heavy duty batteries are not needed.

The unit is 4¼ inches high, 7¾ inches wide and 12½ inches long, a total of 412 cubic inches. Miniaturized with installation in compact cars in mind, it was designed to fit under the dash of the newer, smaller vehicles now marketed, without cramping passengers. No separate speaker is required. An elliptical speaker is built in the front of the unit, so that extra space is not taken at the dash. *Check NP* 582.

Demagnetizer

A NEW demagnitizer offered by the Amplifier Corp. of America, produces complete erasure of recorded signals on all brands of tape and ¼", ½", or 16 and 35 mm. magnetic sound film — on plastic or metal reels of any size from 5" to 15".

This demagnetizer operates on any alternating (50 or 60 cycle) current, and furnishes the necessary gradually diminishing cyclic magnetization field which the tape normally encounters during supersonic erasure. It is easy to use: to erase, you place the demagnetizer on top of, and move it around the reel of tape slowly. Within seconds, the completely erased reel is ready for re-use. Application to new, unused tape will help produce a recording with a greater signal-to-noise ration. *Check NP* 583.

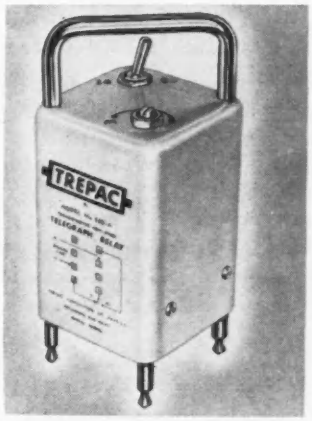
Telegraph Relay

TREPAC Corporation of America has announced a new high speed transistorized telegraph relay.

The Trepac Model 538-A plugs directly into the type 255-A socket in all existing equipment without any adaptors, brackets, modifications, or wiring changes of any kind.

Features of the unit are: Freedom from maintenance; no contacts to clean, adjust, arc, or pit; high speed response without distortion to 200 bits per second (and to 400 b/s if a small percentage of distortion can be tolerated).

Unit operates equally well on any standard telegraph transmission line — two-level 5 and 25 Mils, as well as neutral or polar 20, 30 or 60 Milli-

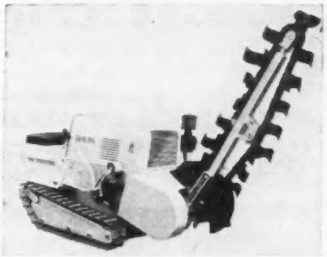


amperes, and at other levels on special order. The purely resistive input, with no inductance in the signal line, and complete isolation between the input and the output circuits, permits any number to be used in series without causing any interaction between other units or associated equipment on the same signalling circuit. *NP* 584.

Trencher-Backfiller

A NEW Model C Davis T-66 Trencher-Backfiller has been introduced by Davis Mfg. Inc.

Among the new features of the unit are: a heavy-duty boom; grit- and moisture-proof seal bearings; built-in, pre-loaded boom shock ab-



sorber to cushion digging impact without power waste; freeze-free auger mounting; pre-loaded torque limit clutch that eliminates shear pins; and simplified, quality-proven hydraulics.

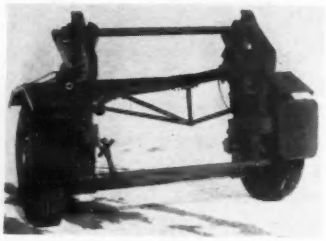
Its digging range is from 12-inches wide, 30-inches deep to 3- and 4-

inches wide, 66-inches deep and at varying widths and depths in between. *Check NP* 585.

Splash Guard Assembly

A NEW fender splash guard assembly has been developed by the Utility Tool and Body Company. On trailers equipped with the assembly the amount of mud, dirt and stones thrown against the trailer and vehicles traveling behind is reduced. Less frequent cleaning and painting of trailers is required.

The unit will fit American Telephone and Telegraph models D, WD, PCP and W-PCP trailers without welding or drilling, for it is mounted

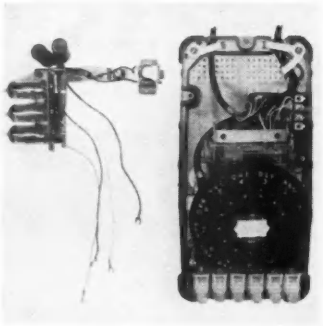


on bolts and nuts which are already on the trailer. The unit can also be readily attached to other trailers. *Check NP* 586.

Signaling Device

AUTOMATIC Electric Laboratories, Inc., has developed a new signaling device which permits ringing on all three lines of the type 87 key telephone instrument.

The common audible signal eliminates the need of two externally-mounted ringer boxes formerly required to provide three-line ringing at one station. The complete buzzer-relay unit mounts in place of the standard ringer for the Type 87. It is activated by ringing voltage on any

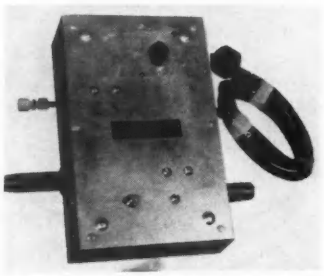


line at that station. A flashing light on one of the three line keys identifies the incoming call. *Check NP* 587.

Automatic Electric Drain

S & G MANUFACTURING Corp. has introduced a new Automatic Electric Drain, designed for installation in ½″ pipe line. Unit features adjustable cycle timer settings.

Unit can be used on air compressor tanks, dehydrators and refrigeration

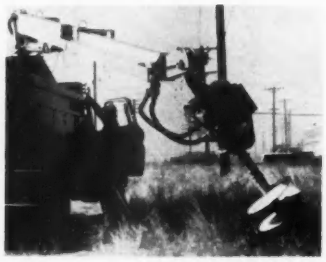


dryers, or any pressure vessel that needs periodic draining. The unit is available in all common A.C. voltages. It can be operated manually by turning the cycle timer indicator. *NP* 588.

Digger Attachment

TRUCK EQUIPMENT Company has announced a new 4-speed hydraulic digger attachment.

Two intermediate gears permit selection of proper speed for most com-



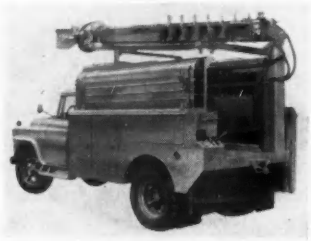
monly found digging conditions. A fourth or super low gear position is supplied which develops the torque necessary for digging in shale, caliche and hardpan. *Check NP* 589.

Construction Body

McCABE-POWERS Body Company has announced production of a new Powers-American body and equipment combination designated the Series 555 two-man line construction and maintenance body.

The unit consists of a 112″ body, featuring reduced overhang at rear and designed for a 84″ CA chassis, equipped with the firm's Series PM-30 "Pole-Master" derrick and Series DF-1 "Earth-Master" digger.

The body contains bin and shelf-equipped compartments, plus ample hooks, racks, troughs and open storage space for tools and materials needed on routine and emergency



jobs. Underfloor winch line and numerous other optional accessories can be furnished to meet specific work needs.

The derrick can be mounted on either rear corner of the body. *Check NP* 590.

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Telephone Industry News Highlights

COAST-TO-COAST REPORTS

- Gen. Tel. President addresses AIEE's Winter General Meeting — stresses need for better marketing to meet competition. . . . Raymond H. Burfeind retires . . . New Bell company to serve 3-state area.
- Robert P. Judy retires; J. Cave named successor . . . Gen. Tel. of Ind. announces $15,000,000 construction program . . . Gen. Tel. of Pa. announces $7,000,000 construction program . . . Increase in new carrier equipment installations.

General Tel. President Stresses Need For Better Marketing To Meet Foreign Competition

GREATLY increased foreign competition and expanding overseas markets present unprecedented challenges to American engineers, Don G. Mitchell, president of General Telephone & Electronics Corp., warned in an address before the Winter General meeting of the American Institute of Electrical Engineers (AIEE) at the Hotel Statler, New York City.

Mitchell cited three major objectives for American industry in meeting these challenges to U. S. world trade. He called for: (1) Greatly increased emphasis on research and development; (2) far greater automation and mechanization of both manufacturing and administrative processes; and (3) more effective marketing, both here and abroad.

"We must not only improve and produce goods and services at competitive costs, but we must develop new products and services, new ways of making them, and new ways of marketing them to customers here or on the other side of the world," Mitchell declared. "The seeds for the new products which you hope you will have seven or eight or ten years from now must be planted *now*. You can be sure that some excellent planting is going on right now in the laboratories of Western Europe and Japan."

Emphasizing that greatly increased automation will be a key factor in elimination of obsolete production processes, Mitchell stated, "Furthermore, our exploding population and steadily rising living standards will require more automation to produce the goods and services our country will need in the future."

Speaking of overseas expansion, Mitchell warned that American industry should regard the rebirth and growth of Free World economies not merely as competition, but as an opportunity for the expansion and development of American operations abroad.

"Western Europe," he said, "is far more than the six nations of the Common Market and the seven who comprise the Free Trade Association, all justifiably seeking to promote trade among themselves and with the rest of the Free World. Far more importantly, Western Europe, with a total output of goods and services roughly equal to 60 per cent of the U. S. total, represents enormous opportunities for American industry, just as the U. S. has provided opportunities in the past for European industry. Here is our greatest opportunity and our greatest challenge — the economy of Western Europe, which has a far greater potential than Russia and the Iron Curtain countries."

Reporting that overseas opportunities have resulted in 3000 American companies investing some $50 billion in foreign manufacturing and marketing, Mitchell added, "Because of the magnitude of this investment, there is every probability that sales from overseas operations will at least double in the next 10 years. U. S. private investment is climbing steadily in Western Europe, and today it is up around $5 billion, which is three times the total of ten years ago. And based upon the trend that has been established, a figure of $6 to $7 billion could be reached in the next few years. That could well be conservative, since American manufacturers

(Continued from preceding page)

are putting nearly 50% of their overseas capital expenditures in Europe."

In meeting these challenges, Mitchell said "every major segment of the American economy must devote far greater attention than ever before to the impact of its actions on the rest of the economy. We must concentrate far more on finding entirely new ways of doing things, we must be prepared to discard traditions and the 'sure thing' if we know down deep within us that there are better ways to do things, we simply aren't looking hard enough."

Veteran Independent, R. H. Burfeind, Retires: Telephone Career Started On January 1, 1899

RAYMOND H. BURFEIND, 1100 S. Dearborn, Chicago, Ill., who started his telephone career in 1899, recently announced his retirement after 61 years of service to the telephone industry.

Known as "Burf" to thousands of members of the telephone industry and recognized from coast-to-coast as the "dean of Independent manufacturing representatives," Burfeind started his career in 1899 with the Western Electric Co.

After four years with Western Electric and the Kellogg Switchboard & Supply Co., he joined Automatic Electric Co. as a designer and engineer. Already an experienced telephone man, Burfeind served three years in Automatic Electric's Patent Department and seven years in Engineering, where he participated in the planning of early dial exchanges, and where he acquired broad experience with all phases of telephone equipment.

In 1914 he entered sales as a district manager, and in 1916 originated the idea, and sold the first group of unattended community automatic exchanges (CAX), thus starting a program of wide scale adoption of such equipment in rural exchanges throughout the country. Later he was placed in central office automatic dial equipment sales, and in this work, for nearly half a century, influenced the widespread sales of dial exchanges in almost every state in the Union.

Although "Engineering" held first claim on Burfeind's talents, his widest field of recognition was in Sales. Always a salesman, Burfeind traveled to every state. Many installations trace their origin to Burfeind, and through his counsel and guidance many companies embarked on successful careers in dial communications.

RAYMOND H. BURFEIND

On December 10, 1942 Burfeind was selected as the recipient for the Talbot G. Martin Award which bears this inscription: "As a tribute to his faithful service, persistent efforts and eminent success in furthering the use of Strowger Automatic communication equipment."

During his career, Burfeind built up what is undoubtedly one of the largest friendships in the telephone industry. As Automatic Electric's ambassador of good will, he could always be found in the center of things, making people feel at ease, getting everyone acquainted, and generating good will for the company.

Burfeind retired from Automatic Electric in 1947, and joined National Telephone Co., as vice president. This company operated telephone companies in several states.

In 1948 he returned to Automatic Electric as assistant to the president of Automatic Electric Sales Corp. He remained with Automatic Electric until May 1957 when he retired.

Since his retirement from Automatic Electric, Burfeind has represented several companies, including S & G Manufacturing Co., Gould-National Batteries, Inc., Lindsay Telephone Supply Co., and Warren Manufacturing Co.

New Bell Company To Serve 3-State Area

THE BOARD of directors of The Pacific Telephone & Telegraph Co. announced that plans are underway to form a new telephone company to operate in Washington, Oregon and Idaho. This new company would acquire the business and properties of the present operating division of Pacific-Northwest, which was established in February, 1960.

All the stock of the new company initially will be issued to The Pacific Telephone & Telegraph Co., but as soon as practicable more than half of the stock of the new company will be offered for sale to the shareholders of Pacific Telephone at a price to be fixed by the board of directors. It is expected that this price will be in excess of par value. The remaining portion of the stock of the new company will be offered for sale to Pacific Telephone's shareholders at a subsequent date or dates. Each offering will be made only by means of a prospectus.

C. O. Lendeman, president of Pacific Telephone, stated that, in view of the increasing magnitude and complexity of the business, there would be important advantages in having separate companies operate in California and Nevada and in Oregon, Washington and Idaho.

Two Companies Propose $2,000,000 Carrier Program

IN A JOINT application to the FCC, the New York Telephone Co. and the New England Telephone & Telegraph Co. have asked construction authority for the installation of carrier equipment to meet a requirement of the U. S. Air Force at Plattsburgh, N. Y., at a total cost of

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Markets as of February 15, 1961	DIVIDEND	BID	ASKED	LAST SALE
American Tel. & Tel. Co.	$3.30			111¾
Anglo-Canadian Tel. Co. (Br. Col.-Dom. Rep.)	1.20	49	52	
Bell Tel. Co. of Canada	2.20			49⅜
British Columbia Tel. Co.	2.20	48	51	
Calif. Interstate Tel. Co. (Calif., Nev.)	.70	15¾	16¾	
Calif. Pac. Util. Co. (Calif., Nev., Ore.)	.90	24	26½	
California Water & Tel. Co.	1.36	33	35	
Carolina Tel. & Tel. Co.	1.60	42½	—	
Central Electric & Gas Co.	1.20	32	34	
Central Tel. Co. (Minn., Ia., N. C.)	.88	25¾	27¾	
Chenango & Unadilla Tel. (N. Y.)	1.20	26½	—	
Cincinnati & Suburban Tel. Co.	4.50	104½	108½	
Citizens Util. Co. (Calif., Pa.) "A"	stk. only	21½	23	
Citizens Util. Co. (Calif., Pa.) "B"	.56	20½	22	
Commonwealth Tel. Co. (Pa.)	1.00	23½	25½	
Florida Tel. Corp.	1.00	29	30¾	
General Tel. & Electronics Corp.	.76			28¼
Hawaiian Tel. Co.	1.00	29	31	
Independent Tel. Co.	none	8½	9½	
Indiana Tel. Co.	.50	25	—	
Inter-County Tel. & Tel. Co. (Fla.)	.72+stk	27½	30	
Inter-Mountain Tel. Co. (Va., Tenn.)	.80	17½	19	
International Tel. & Tel. Corp.	1.00			50⅛
Jamestown Tel. Corp. (N. Y.)	6.00	88	—	
LaCrosse Tel. Corp.	.80	15½	—	
Lincoln Tel. & Tel. Co. (Nebr.)	2.60	65	—	
Lorain Tel. Co. (Ohio)	1.40	32	—	
Middle States Tel. Co. (Ill.)	.80	28	30	
Mountain States Tel. & Tel. (Ariz., Colo., Mont., Tex.)	.90			28½
New England Tel. & Tel. Co.	1.72			43⅛
North Carolina Tel. Co.	none	1	1⅛	
Northern Ohio Tel. Co.	2.00	61	64½	
Pacific Tel. & Tel. Co.	1.14			35⅞
Peoples Tel. Corp. (Pa.)	4.00	100	—	
Pioneer Tel. Co. (Minn.)	1.00+stk	34	38	
Rochester Tel. Corp. (N. Y.)	1.00			24⅞
Southeastern Tel. Co. (Fla.)	1.00	24	26½	
Southern Nevada Tel. Co.	1.20	38	42	
Southern New England Tel. Co.	2.20	40⅛	41⅝	
Southwestern States Tel. Co. (La., Ark., Okla., Tex.)	1.28	27¾	29¼	
Telephone Service Co. of Ohio "A"	.36	30½	33	
Telephone Service Co. of Ohio "B"	.36	30½	33	
Tidewater Tel. Co. (Va.)	1.40	26	—	
United Utilities, Inc.	1.60	49	51	
Virginia Tel. & Tel. Co.	1.00	21	23	
West Coast Tel. Co. (Wash., Ore., Calif.)	1.28	31¼	33	
Western Union Telegraph	1.40			42½
Western Utilities Corp.	.36	10⅝	11⅝	
Western Light & Tel. Co., Inc. (Mo., Kans., Ia.)	2.40	51	54	

(Source of Market — DEAN WITTER & CO.)

$2,085,000 to the two companies and connecting carrier territories. Approximately 205 sheath miles of specially protected buried and submarine cable, 18 specially reinforced manholes, 131 carrier repeaters, and 120 carrier terminals will be needed to provide about 10,000 channel miles of facilities to meet Plattsburgh missile squadron requirements.

Also last month a joint application from the Chesapeake & Potomac Telephone Co. and the Chesapeake & Potomac Telephone Co. of Virginia asked FCC approval for construction of $660,000 in cables and carrier systems to provide for additional service demand created by the establishment of Central Intelligence Agency headquarters in Langley, Va., near Washington, D. C. The CIA central building at Langley is under construction.

In another joint application, the Bell Telephone Co. of Pennsylvania and the Chesapeake & Potomac Telephone Co. of West Virginia requested authorization for the installation of N-1 carrier systems between Morgantown, W. Va., and Pittsburgh, to cost $53,600. Existing circuits are being transferred to carrier channels to improve transmission and to release voice frequency facilities to provide for an increase in short haul requirements.

The Southern Bell Telephone & Telegraph Co. asked FCC approval of proposed R carrier systems installations, at a cost of $46,000, between Rock Hill, Lancaster, and Columbia, S. C. The systems are to provide for large increases in message circuits between these points.

Robert P. Judy Retires: J. Cave Named Successor

ROBERT P. JUDY retired as assistant vice president in the American Telephone & Telegraph Co. department dealing with relations with connecting companies and other communications organizations, effective March 1, and has been succeeded by Jere Cave, assistant vice president of the Ohio Bell Telephone Co.

Cave, effective February 1, became an AT&T assistant vice president in the department headed by Vice Presi-

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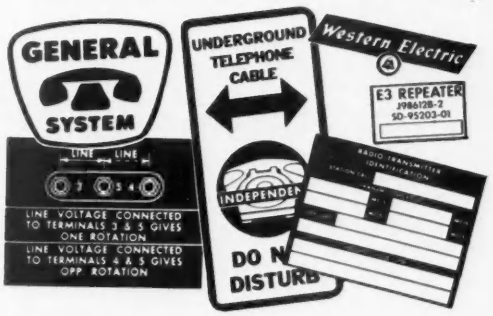
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2174A	300 Cycles to 400 Kilocycles	50 Cycle or 100 Cycle Filter*	−68 to +32dbm	± .5db −80 to +32dbm 300 to 400 Kilocycles	**50 CYCLE FILTER**** 6db— 60 Cycles 60db—450 Cycles
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dent George L. Best. He has been serving as Ohio Bell assistant vice president in the company's operations group at its Cleveland headquarters. In the Ohio Bell assignment, Cave is being succeeded by Carl Carlson, engineer of plant extensions in the company's Southwestern Area.

Judy began his telephone career in 1922 with the Pacific Telephone & Telegraph Co. He joined the AT&T commercial division in 1927, becoming commercial results and practices engineer in 1936. After five years as general commercial manager in the Pacific Telephone Washington-Idaho Area, starting in 1938, he returned to AT&T in 1943 as commercial staff engineer. He was named an AT&T assistant vice president in June, 1950, and assumed his present responsibilities six months later.

Gen. Tel. of Indiana President, L. H. Meyer, Announces $15,000,000 Construction Program

GENERAL Telephone Co. of Ind., Fort Wayne, has announced the company intends to spend a total of $15,000,000 for the construction of gross additions to its facilities during 1961.

L. H. Meyer, company president reports the company's plant investment exceeds $116,000,000, and will continue to rise along with the accelerated construction program planned for the coming years. He pointed out that this figure almost doubles the amount which was in service at the beginning of 1957.

The 1961 program includes the conversion of two exchanges from manual to dial operation; one from magneto to dial; extensive cable projects throughout the company's 5,615 square miles of territory; and the addition or replacement of dial equipment in many central offices.

Direct Distance Dialing facilities will be placed in service at Wabash and Rushville in the next few months. A total of almost 11,000 phones will be added to the nationwide DDD network by the two conversions. All Number Calling will be used in all the conversions and replacements of equipment which will be made this year.

Another major program to be furthered this year will be the changeover to Mark Sensing methods of toll ticketing and customer billing of four more of General's long distance traffic centers. Rushville, Wabash, Richmond and LaPorte are scheduled to begin using the new system this year.

This year, construction of a central office will begin for the new Portage area. Exchange boundaries have already been established, and a site selected for the new office. In completing this project, General will spend more than two million dollars in the proposed construction and conversion program.

It is expected that initially some 3,000 telephone customers will be served by the new facilities at the time of conversion. Indications are that this area will grow tremendously in the next few years. Midwest has already developed a multi-million dollar plant in the area and other major steel companies are developing plans for similar facilities. In addition, the federal government is considering the construction of inland port and harbor facilities in the area.

President Meyer pointed out that the overall 1961 construction budget of 15 million dollars includes erecting more than 6,000 poles; placing over 515 million conductor feet of wire in cable of various sizes; purchasing about 35,000 new telephone instruments; approximately 90 new vehicles of various descriptions; and tools and other miscellaneous equipment necessary to carry out the program.

At the beginning of last year, General of Indiana provided service to some 328,000 telephones in 95 exchanges over the northern two-thirds of the state. With the recent merger of the Richmond (Ind.) Home Telephone Co. into General of Indiana, and including internal growth, the company now serves a total of almost 362,000 telephones. General of Indiana is now the third largest operating company of the General System in terms of telephones served.

De Queen Tel. Observes 60th Anniversary

THE De Queen (Ark.) Telephone Co. recently celebrated its 60th anniversary with an open house program that gave visitors the opportunity to see the company's new building and dial switchboard equipment in operation.

Free coffee and soft drinks, as well as souvenirs, were served and 20 door prizes given. These included 10 free long-distance telephone calls (three minutes) to any point in the continental U. S., plus 10 Cinderella telephones (one year's free service) to any of the firm's present telephone subscribers.

On display during open house were Cinderella phones, colored phones, two-line switch telephones, two-line telephones with hold key systems, Code-a-Phone and new ITT Kellogg pay stations. Exhibits included the Bell solar battery, which converts light into energy and a recording of the visitor's voice on the telephone, with sound wave patterns of the voice.

The De Queen firm, headed by J. E. Wommack, serves Lockesburg, Horatio and Dierks, in addition to De Queen. New buildings, plus dial-telephone systems, were completed in each of the four towns during the company's remodeling program of four years ago. This program involved $350,000 in expansions and modernization.

The De Queen Telephone company was founded in 1900 by J. A. Wommack. Wommack, who was in the drug business at the time the system was installed, sold his drug interests in 1902 to devote full time to the growing company.

Crank-type telephones were used until about 1920 when the common battery system was installed. It was the first such system to be installed in the area for a town of comparable size to De Queen.

Wommack continued as active manager of the company until his death in 1935. J. E. Wommack then

headed the firm from 1935-41, after which managership passed to Waverly "Bud" Wommack. He continued in that position until his death in 1946. In 1947, "Ernie" Wommack returned to De Queen, after 15 years of service with ITT Kellogg, and has been manager since.

Today, the De Queen Telephone boasts the latest in dial equipment, serves hundreds of customers in each of the four towns, continues to make extensions and improvements, and through connections with Southwestern Bell, offers quick long-distance service to any part of the world.

For the past three years, since the extensive modernization program, De Queen Telephone concentrated on building rural telephone lines. A certain number of rural lines are built each year and will eventually serve every sector of the country where such service can be economically justified. Less than 50 rural subscribers were served 10 years ago. Today, 426 rural subscribers on lines out of the four towns served by the firm. This represents one fourth of all stations in De Queen, Horatio, Lockesburg and Dierkes.

J. E. WOMMACK

General Telephone Co. of Pennsylvania Plans $7,000,000 Construction Program

GENERAL Telephone Company of Pennsylvania will spend approximately $7 million in 1961 in expanding and improving services throughout its six divisions, it was announced recently by C. E. McCormick, president.

This figure represents an increase of more than $2.5 million over last year's expenditures.

In announcing the budget, McCormick said 1961 will bring evidence of the company's effort to provide greater diversity and utility in telephone service.

"Greater emphasis is being placed on the provision of full communications for the home, for business and for industry," he pointed out.

With new technical advances, he said, the company is constantly expanding to provide greater versatility of service.

At the end of last year General Telephone of Pennsylvania served 210,095 telephones in Pennsylvania with 96,466 in the Erie division; 55,685 in the Johnstown division; 27,055 in the Oil City division; 14,053 in the Somerset division; 9,089 in the Vandergrift division; and 6,349 in the Sayre division.

Some 79,519 telephones are serviced by the York Telephone & Telegraph Co., and 1,949 by the New Wilmington Company. These companies are operated by the General Telephone Co. of Pennsylvania.

The company employs approximately 2,015 persons, including those in the York and New Wilmington operations.

Among the major projects scheduled throughout the six divisions this year is the conversion to "All Number Calling," or ANC, in six areas throughout the Johnstown division — Ferndale, Holsopple, Geistown, Beaverdale, Seward and South Fork.

A change in the long distance dialing procedure is also slated this year in the Johnstown division. Customers will dial only "0" (Zero) to reach the operator for all long distance calls, it was pointed out.

In the Vandergrift division the bulk of the work necessary for dial conversion of the Vandergrift main office in 1962 will begin this year. Construction of a new Vandergrift Main Building, to cost $185,000, will get underway in 1961.

In addition to this project, installation of 3,100 lines and 5,500 terminals, at a cost of about $422,000, is scheduled for 1961.

Total cost of the overall dial conversion project is approximately $755,000.

Carrier Installations On The Increase

COAST-TO-COAST activity in installations of new carrier equipment by U. S. telephone companies is increasing.

On the West Coast, Pacific Telephone & Telegraph and Bell Telephone Co. of Nevada have received FCC authorization to proceed with installations costing $1,800,000. The systems will be installed between San Diego and Seattle to provide for an estimated 17% increase in requirements during 1960, and an additional 14% prior to completion of the project.

On the East coast, New Jersey Bell Telephone Co. and New York Telephone Co. received FCC approval of its plans for new carrier facilities costing $1,616,700. The approval granted New Jersey Bell and New York Tel. is for N-1 carrier systems in critical cross sections of trunk routes from New Jersey to New York, to provide relief for growth resulting from continued business, industrial, and residential expansion in northern New Jersey. Without the relief proposed, it was stated, an estimated deficit of 1,078 facilities would result by July, 1962.

Two joint applications were received by the FCC last month from Northwestern Bell and AT&T. One proposes construction of an N carrier toll cable between Hastings and Wabasha, Minn., at a cost of $710,960. The proposed buried cable will complete the final section of the Hastings-LaCrosse, Wisc., toll cable to provide stormproof facilities for growth and improvement. In addition, the project will permit removal of open wire toll line due to scheduled highway improvements.

The other Northwestern Bell-AT&T

application asks approval for construction of an N carrier toll cable between Illgen City and Grand Marais, Minn., to cost $583,640. Relocation of existing toll line due to new highway construction is also involved, and the application stated that the proposed cable installation will avoid excessive costs of complete rebuilding of the toll line due to proposed highway realignment and construction scheduled in 1962.

ITT Kellogg Announces New Regional Offices

FORT WAYNE, Ind., and Davenport, Iowa, have been designated by ITT Kellogg as headquarters for the new Great Lakes and North Central Regions respectively, to replace the North Central Region in Chicago which served Independent telephone companies in both areas.

In making the announcement Charles J. Trees, vice president and director of marketing, said the new regional alignment was made to bring more direct and personalized service to Independents.

"With the growth of our business, we felt the need to bring our field operations closer to our customers," Trees explained.

The new Great Lakes Region, with its headquarters at 802 Knitters Avenue, Fort Wayne, will be managed by Robert R. Oman and includes Michigan, Indiana, Ohio and West Virginia.

The North Central Region, with its office at 1111 East River Dr., Davenport, Iowa, will be managed by George C. Taylor and includes Minnesota, Illinois, Iowa and Wisconsin.

The Great Lakes Region will include a warehouse. Deliveries for the North Central Region will be made from the South Central Regional warehouse at Kansas City, Kan., because of better transportation facilities.

Oman joined ITT Kellogg as salesman in Wisconsin. He became a divisional sales manager in Chicago in 1956 and regional sales manager in 1958.

Taylor joined ITT Kellogg in 1956

ROBERT B. LIEPOLD, vice president of Automatic Electric Sales, right, greets Mr. and Mrs. FRED S. FLORANCE at the Dearborn Street Station in Chicago. Florance, general manager of Highland Telephone Co., Highland, N. Y., was one of the featured speakers at the recent general sales conference held by AE Sales of Northlake, Ill. Other Independent telephone company officials who took part in the presentation, "The Telephone Man Speaks," were Harry Hammond, chief engineer of Southwestern States Telephone Co. of Brownwood, Tex., and K. L. Schroeder, vice pres. Northwestern Tel. Co., Freeport Ill.

Representatives of Automatic Electric Sales, Northlake, Ill., are shown during the recent general sales conference held at O'Hare Inn, Des Plaines, Ill. Over 100 communications products division representatives attended the January 23-26 conference. The four-day meeting provided sales personnel with information on the latest communications products and techniques. Shown in the front row, second from left, is DARWIN H. DEAVER, president of AE Sales. To the right is WILLIAM S. GAGE manager, marketing services division, and MARION GNAU, director of sales training.

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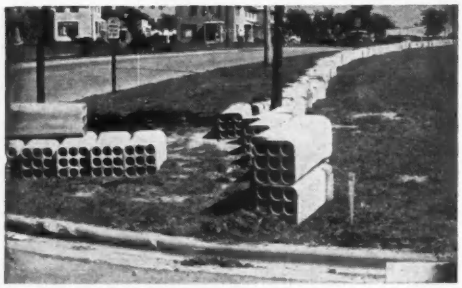

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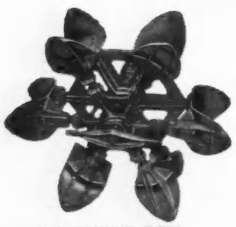

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as a sales supervisor and subsequently was engaged in the company's missile and space program. He formerly owned the telephone company in Delton, Mich., and was also employed by Wisconsin Bell Telephone Co.

Collins Sets New Dates For Symposium Tour

NEW appearance dates for the microwave and carrier communication system engineering symposium sponsored by the Texas Division of Collins Radio Co., Dallas, Texas, have been issued by the company.

The symposium, which is being conducted on an extended nationwide tour, is to acquaint management and communication personnel in governmental and industrial circles with the engineering parameters and application techniques of microwave and carrier equipment.

New dates and the cities where the symposium will be held include: March 13, Portland, Ore.; March 27, Seattle, Wash.; April 10, Denver, Colo.; and April 24, Chicago, Ill.

The exhibit accompanying the symposium consists of one RF frequency diversity terminal and 12 channels of carrier equipment (part of a 600 channel system).

Symposium topics include: Introduction to Microwave Techniques; Path Considerations; Path Engineering Criteria; Preliminary Design Factors; Legal Requirements; RF Applications and Techniques; Carrier (Multiplex) Design; Powering Variations; Compatibility; and Theory of Operation vs Design Parameters.

For complete information write: *Collins Radio Co., P. O. Box* 1891, *Dept. TE&M, Dallas* 21, *Texas.*

H. B. Miller Joins Stromberg-Carlson

HARRY B. MILLER has been named manager of the newly-formed Electroacoustics Advanced Development Laboratory in Stromberg-Carlson's Electronics Division.

Miller was with the Clevite Research Center, Cleveland, Ohio, where he was manager of the Acoustics Engineering Department. In that position he developed a number of new products in the fields of acoustics and magnetic recording.

"Management"

(Continued from page 38)

planned for the particular interest of independent telephone executives. It was scheduled for the last week of the program, this followed three weeks of Control and Financial Administration, so that the participants would have a broader background for understanding many of the factors involved in rate structures, regulations, and proceedings before regulatory bodies.

Such topics as the theory of regulation, current trends in regulation, management's responsibility as to rate regulation, and preparation of rate cases were covered through lectures and discussion. A mock rate case in which each participant had a part was used in this area.

Classroom Instruction

THE instructors who taught us at Lawrence were proven, capable professors, and as individual men they were outstanding. Three of the professors were on the regular teaching staff of the University of Kansas School of Business, while one was commissioned from the Harvard Business School, and another from the University of Virginia.

On several occasions our regular classroom instruction was supplemented by special guest instructors who lectured the class on a particular matter.

Probably the most memorable of the special lectures which were held were the ones presented by R. Parker Sullivan, vice president in charge of marketing and sales, General Telephone Company.

Mr. Sullivan provided some ideas that were very thought provoking concerning the growing competition all telephone companies are facing today. He pointed out also the obvious fact that many telephone companies *still* consider themselves in a non-competitive business.

Mr. Sullivan summarized by saying that he and his company were of the opinion that the telephone industry and the individual telephone companies had better *wake up* to this fact of competition and become truly "com-

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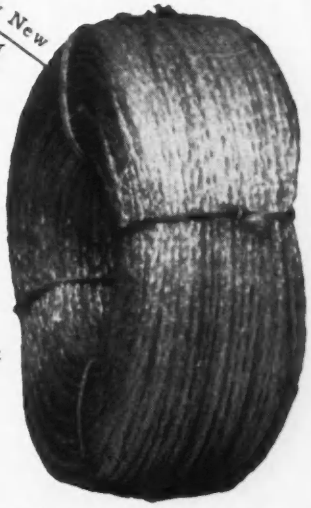

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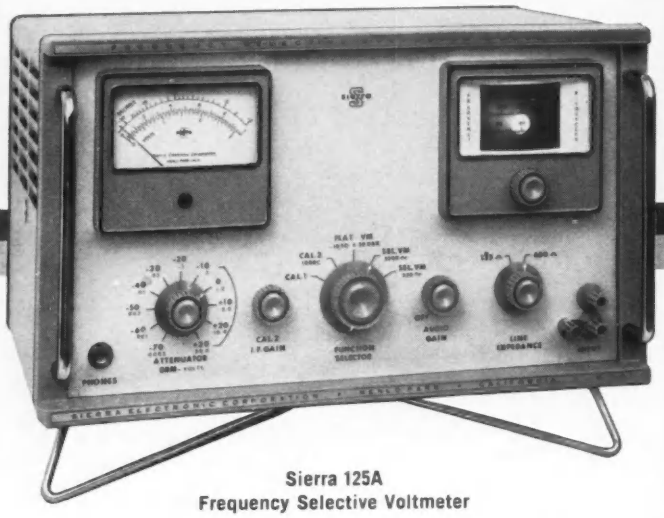

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As a frequency selective voltmeter, Sierra 125A covers 3 to 620 KC continuously on a 40" scale. An up-converter with high IF and single conversion keeps spurious responses down 60 db. Crystal lattices provide two steep-skirted IF bandwidths — 250 cps or 2.5 KC.

As an AC VTVM, Model 125A offers response flat within ± 0.2 db, 1 KC to 620 KC, and measurement accuracy of better than ± 0.5 db. This additional mode increases the instrument's versatility and facilitates measurements on carrier systems.

Measurement range is —90 to +32 dbm in selective mode and —30 to +32 dbm in the flat mode. Signal levels are read directly on either 135 or 600 ohm lines, balanced or unbalanced. Line bridging loss is less than 0.25 db over the entire frequency range. Built-in 100 KC crystal oscillator provides accurate reference for both level and frequency calibration. Modular construction and etched epoxy glass circuit boards provide ease of access and operating dependability.

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munication companies" meeting and beating all competitive lines wherever possible.

The facilities at the school were most conducive to an atmosphere of learning. The personnel there also were most helpful in making our four weeks stay an enjoyable and productive one.

I would like to close by *commending* the USITA Personnel Committee for its decision to hold and to sponsor schools of this and other types. Many, many telephone companies would not be able to provide their people with the necessary training to get a better job done if it were not for this concerted effort by our Association. I can assure you that my classmates and I can testify to their long term value to each of our Companies. — *Mitchell N. Drew.*

New Booklet Discusses Microwave Measurements

A 100-PAGE application note presenting basic information on microwave measurements is now available from the Hewlett-Packard Co. The note, in booklet form, is entitled "Introduction to Microwave Measurements." It is particularly useful to colleges and universities, and to industrial and government groups who must regularly introduce new technical personnel into the specialized field of microwave measurements.

The fully-illustrated booklet presents general background information on microwaves, discusses microwave transmission theory, and describes basic microwave measurements and the equipment used in making these measurements. It also presents eight basic experiments designed to help the student or microwave novice become acquainted with measurement techniques.

Appendix material includes a glossary of microwave terms and data sheets on various microwave measuring equipment.

Copies of "Introduction to Microwave Measurements" (Application Note No. 46) may be obtained by writing *Harry J. Lewenstein, Hewlett-Packard Co., Dept. TE&M,* 1501 *Page Mill Road, Palo Alto, Calif.*

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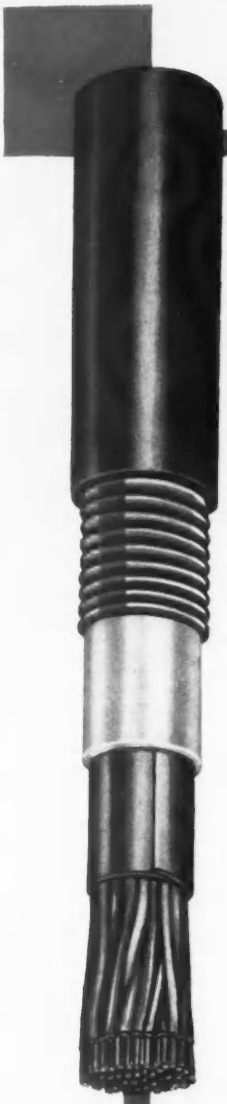

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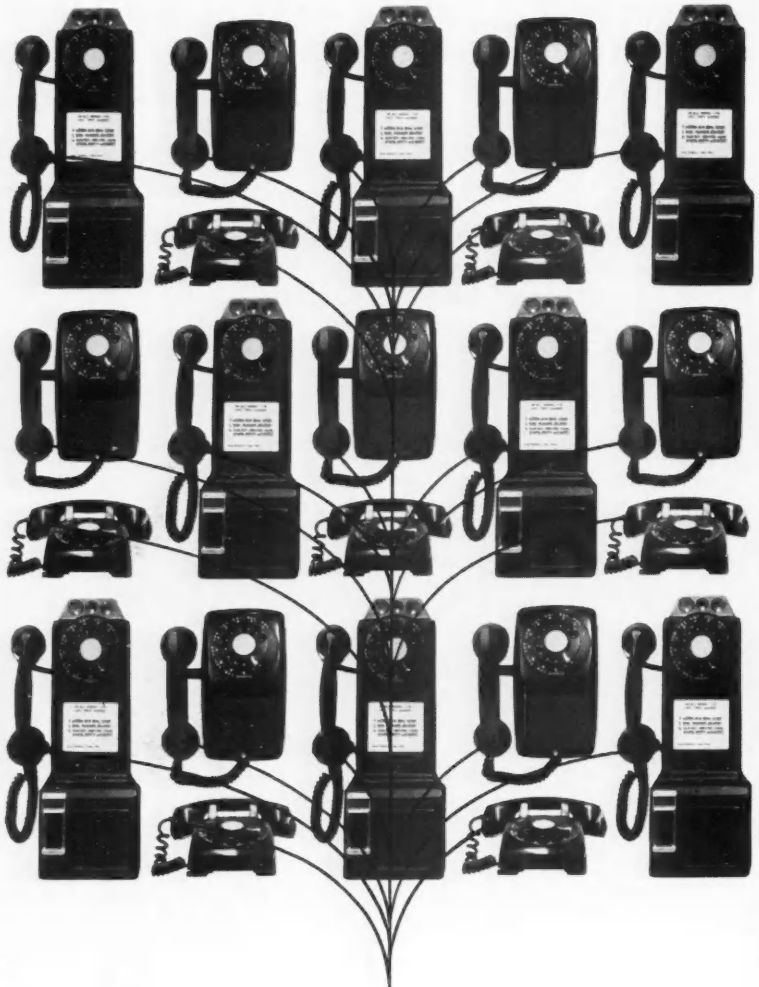

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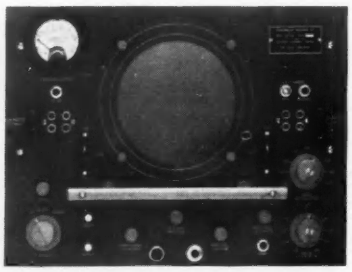

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Wilcoxon Named Ass't. Mgr., Leich's Motor Vehicle Dept.

D. C. GIBSON, president of Leich Sales Corp., Chicago, has announced the appointment of Kenneth L. Wilcoxon as assistant manager of Leich's Motor Vehicle Department.

In this position, Wilcoxon will serve the automotive needs of the Independent telephone industry. He reports to R. J. Timko, manager of the Motor Vehicle Dept. Leich handles a complete line of automobiles, trucks, truck bodies, tires, and batteries.

K. L. WILCOXON

Before joining Leich, Wilcoxon was employed by a construction company. He also served in the Navy for two years, and attended Bradley University, Peoria, Ill.

ITT To Acquire Jennings Radio Mfg. Corp.

AGREEMENT has been reached for the acquisition by International Telephone & Telegraph Corp. of Jennings Radio Manufacturing Corp., San Jose, Calif., manufacturer of vacuum capacitors and switches.

The agreement, approved last month by the board of directors of both companies, was announced by H. S. Geneen, president of ITT, and Calvin K. Townsend, chairman, and Jo-Emmet Jennings, president, controlling shareholders of the West Coast corporation.

Purchase price was not disclosed but the agreement involves an exchange of ITT stock for the assets of Jennings.

Jennings will operate as an autono-

Please turn to page 70

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Holan's 7500 Corner-Mounted Derrick parks at the curb and digs a hole in hard, frozen ground. Because the derrick lowers all the way to the ground, no auger extension is needed to dig a hole 8 feet deep.

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Coupled with the tremendous up and down feed pressures (ranging from 3600 to 5400) of the 7500 Derrick, the 5400 Earth Borer is slashing digging costs every day. That's because it positions quickly, digs up to 30" holes eight feet deep without an auger extension . . . and is powered to "bury its head" in frozen and rocky soil — then spin off at 280 rpm's.

See this derrick/digger combination — engineered as a unit by Holan to avoid body stresses and minimize derrick stresses — before you buy any derrick or digger. We'd be glad to send you literature on the 7500/5400 Unit — or on our 3750 and 6800 standard-mounted derricks and the new Holan 7700 Center-Mounted Derrick.

The Holan 7500 is the only corner-mounted derrick on the market that can handle the 8400 foot-pounds of torque of Holan's 5400 Earth Borer — the most powerful derrick-suspended earth borer built today. The 5400 has three speeds: one for hard digging, one for normal digging, and a fast spin-off speed.

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GCC

GENERAL CABLE CORPORATION

Pictured above are members of the General Telephone Directory Company's management staff who participated in the January 16-20 Las Vegas, Nev. Management Conference. From left to right, front row, are: R. T. BEARD, vice president-sales, Des Plaines, Ill.; DEAN PORTER, general publishing manager, Des Plaines, Ill.; W. E. CATHERS, National Yellow Pages service manager, Des Plaines, Ill.; DON BRIGGS, division manager, San Angelo, Texas, division; LESTER J. BARTON, division manager, Muskegon, Mich.; LEW BEELER, sales supervisor, Ft. Wayne, Ind., division; DAVE SIMPSON, division manager, Ft. Wayne, Ind.; JACK T. WARD, division manager, Bloomington, Ill.; RAY HATFIELD, division manager, Lexington, Ky.; O. R. STIGALL, eastern regional manager, Ft. Wayne, Ind.; O. D. SWANSON, vice president-production, Des Plaines, Ill.; and PAUL ROSSITER, division manager, Long Beach, Calif. In the back row, from left to right, are: CAL BREEDING, division manager, Honolulu, Hawaii; HARRY STEVENS, vice president and sales manager, Dominion Directory Co., Ltd., Vancouver, B. C.; E. T. JORDAN, western regional manager, Long Beach, Calif.; H. DUNCAN PRICE, director of public relations and advertising, Des Plaines, Ill.; W. H. LOOMIS, president, Des Plaines, Ill.; PAUL GADBOIS, director of sales training, Des Plaines, Ill.; MAX GUDOWSKI, division manager, Columbia, Mo.; JOHN O'NEIL, secretary and controller, Des Plaines, Ill.; DON POWERS, chief accountant, Des Plaines, Ill.; OWEN STAYNER, division manager, Erie, Pa.; L. A. BUCKLAND, division manager, Madison, Wisc.; WARREN ROLPH, vice president, Downey, Calif.; ED FILLIPOW, assistant division manager, Long Beach, Calif.; R. K. HICKMAN, assistant division manager, San Angelo, Texas; ORVILLE SPRADLING, sales supervisor, San Angelo Texas Division; FRED DORR, sales supervisor, Durham, N. C., division; ALLAN ANDERSON, division manager, San Francisco, Calif.; A. S. VINCE, president, Dominion Directory Co., Ltd., Vancouver, B. C.; TED MERTENS, division manager, Spokane, Wash.; JOHN QUINT, sales supervisor, Long Beach, Calif., division; PAUL SCHEWE, division manager, Durham, N. C.; and HAROLD DAVIES, assistant sales manager, Dominion Directory Co., Ltd., Vancouver, B. C.

(Concluded from page 66)

mous subsidiary of ITT. It will continue serving its worldwide customers as before with its present management and sales force, both at the San Jose facility and a new plant being constructed at Moss Landing, Calif., exclusively for power switch development and manufacture.

Founded in 1942 and privately held, Jennings is the recognized leader in the field of non-thermionic vacuum components. Under the leadership of the two principals, company sales, supported by an extensive research and development program, have increased 10-fold in the past decade. It is a major supplier of vacuum switches used in power lines for the handling of very high voltages.

The company developed the basic fixed and variable vacuum capacitors used primarily in medium and high-power communication transmitters in ground stations, ships, airplanes and mobile units such as jeeps. It has since developed a complete line of vacuum relays and coaxial switches used in military and commercial communications, radar, and the control circuits of many missiles, and its products are as well accepted abroad as in the U. S.

Gen. Tel. Directory Holds Mgmt. Conference

GENERAL Telephone Directory Company's annual Management Conference was held in Las Vegas, Nev., January 16, 17, 18, 19, and 20. The conference was attended by management personnel from the company's Des Plaines, Ill. office, the two regional offices, and from the company's 13 division offices. Also in attendance were personnel from General's affiliated company, the Dominion Directory Co. of Vancouver, B. C.

Wesley Loomis, president of the directory company, opened the meeting and reviewed the accomplishments of 1960, and discussed the challenges of the future. During the conference the division managers presented their proposed plans of operations for 1961.

Roland T. Beard, vice president-sales, stressed the importance of following the basic fundamentals of good salesmanship, and explained the intensified training and re-training program under way at the company. New methods, procedures and techniques currently in practice and forthcoming, which mean greater efficiency to the company, were reviewed by O. D. Swanson, vice president-production.

The 1960 advertising and promotion program was presented by H. Duncan Price, Jr., director of public relations and advertising.

Several outstanding guest speakers addressed the conference, including Don G. Mitchell, president of General Telephone & Electronics Corp.; F. A. Dresslar, Sr., president of Southern Nevada Telephone Co., Las Vegas; Dr. Robert M. Wald, vice president of George Fry & Associates, Los Angeles; Richard L. Bradley, manager, personnel division of Lester B. Knight & Associates, Chicago; R. T. King, administrator of directory operations for AT&T; and Ed Hancharik, Yellow Pages supervisor, AT&T.

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UNTIL 1958, the Editorial Index was published as a part of each December 15 issue of TELEPHONE ENGINEER & MANAGEMENT. However, as a special service to many readers who asked for a more complete index, the editors of TE&M issued the annual Index as a separate publication in 1959.

THE INDEX to the editorial contents of the 24 issues of TELEPHONE ENGINEER & MANAGEMENT published in 1960 will serve as a handy reference tool for all members of the telephone industry. It is being carefully prepared to provide each Index user with a complete guide to the information published by TELEPHONE ENGINEER & MANAGEMENT on all phases of telephone company operations — accounting, associations, commercial, electronics, engineering, marketing, plant, regulation, traffic, new products, and many other subjects.

WE URGE all TELEPHONE ENGINEER & MANAGEMENT subscribers to fill out the following order for the "1960 Editorial Index" of TELEPHONE ENGINEER & MANAGEMENT. Copies of the index will be mailed in March, 1961 at no charge to each TE&M reader who has requested a copy.

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THE BACK OF THE BOOK

By JOHN G. REYNOLDS

USITA's 1961 Management Development Program

THIS is the time of year when the managements of Independent telephone companies should seriously consider arranging for *one or more* of their *key employes* to apply for enrollment at the Management Development Program sponsored annually by the United States Independent Telephone Association (USITA).

This program is conducted at the University of Kansas, Lawrence, Kans. The 1961 Program is scheduled for the four-week period July 16 to August 11, 1961. Enrollments are limited to a total of 48, and the 1961 enrollment closing date is April 1.

Brochures describing the 1961 Program were placed in the mails late in January. If you failed to receive a copy contact the secretary of your state telephone association, or write *Dr. James R. Surface, Director, USITA Management Development Program, c/o University of Kansas, School of Business, Lawrence, Kans.*

The USITA Management Development Program is the result of several years of study and development work by USITA's Personnel Committee and by the University of Kansas School of Business. During this study and development period, members of USITA's Personnel Committee visited many universities throughout the country and were aided materially by counseling with the best experts in the field of management development work.

The program is designed for executives who currently have important administrative responsibilities. Areas of development are grouped under three general headings — "The Functions of Administration;" "The American Business Climate;" and "Rate Regulation." "The Functions of Administration" portion is, in turn, subdivided to include — "Control and Financial Administration;" "Human Relations in Business;" "Merchandising;" and "Administrative Policy and Planning." The case method of instruction is used throughout much of the program.

Important improvements being made in the 1961 program reflect the benefit of more successful methods used in previous years, and other improvements suggested by faculty and participants. Faculty for the 1961 program is comprised of experts in the areas of their respective responsibilities. Dr. James R. Surface, formerly of the Harvard Business School faculty, now Dean of Kansas University School of Business, is director of the program. He has had extensive experience in management development work for telephone companies and others, throughout the United States and in Canada.

Time To Register For Engineering Conference

THE FIFTH annual Telephone Engineering Conference, sponsored by the USITA, will be held June 25th to July 15th at Michigan State University, East Lansing, Mich.

As in the four previous years, the main objective of the 1961 conference will be to instruct and aid engineers and technical personnel of all communications companies in obtaining maximum utilization of every construction dollar. Special emphasis will be given to economic concepts, the relationship of earnings to capital requirements, and the necessity for integrated planning between all departments and segments of the telephone industry.

Highlighting this year's conference will be addresses by outstanding men in the communications industry. Subjects to be covered will include: (1) toll ticketing equipment, automatic number identification and all-number calling; (2) electronic switching equipment and its application to the telephone industry; and (3) "Things To Come" — a report on the latest developments in the field of communications.

Brochure describing the 1961 conference and applications blanks were mailed to USITA member companies last month. Since the conference will be limited to 60 participants, it is recommended that the applications be submitted at an early date. For advance registration or information, please contact *Professor John U. Jeffries, Electrical Engineering Department, Michigan State University, East Lansing, Mich. Telephone: EDgewood* 2-1511, *Ext.* 2826.

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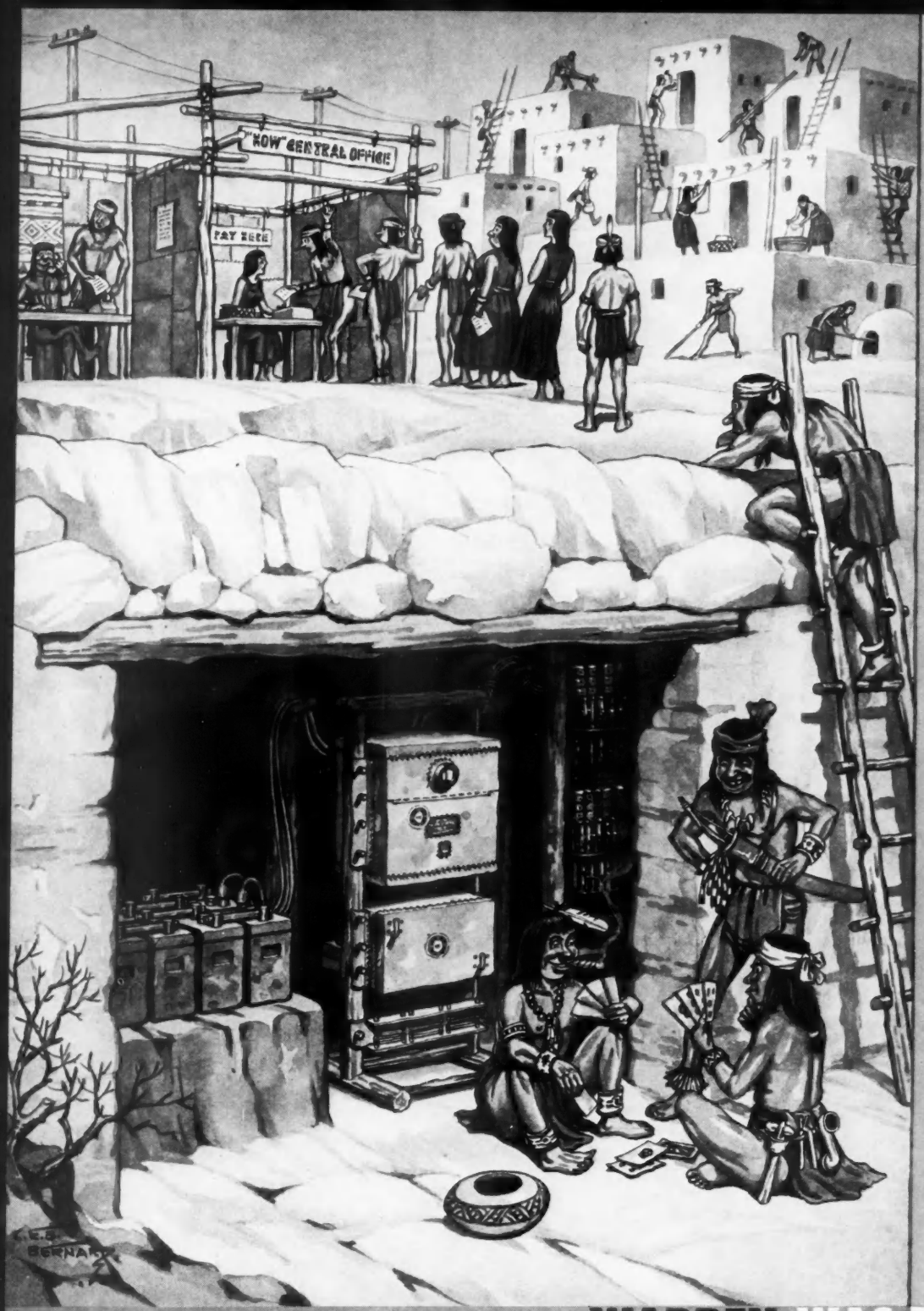

NO. 2 OF A SERIES

* Just in back of the cigar store Indian, you'll note the Warren TFR — a solid state, constant voltage, fully automatic battery charger. Warren offers a complete line in a full range of current ratings in 24, 48, and 130 volt models.

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. . . because they last longer. Long-lived silicon rectifiers and other conservatively derated components designed for 30 years of trouble free operation.

. . . because they save space. Warren TFR's are really compact.

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. . . because (as the card players will tell you) they leave maintenance people with little or nothing to do — provide a level of dependability that makes TFR's unique.

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TYPE TFR — Transistor Float Rectifiers
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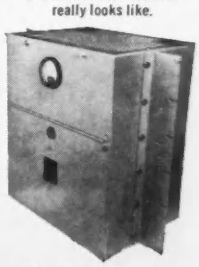
(AND WITH SILICON RECTIFIERS, YET!)

Here's what a 48TFR-24, 48 volt, 24 amp Transistor Float Rectifier really looks like.



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